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For Bay Area Computer Buyers
Starts on Page 86

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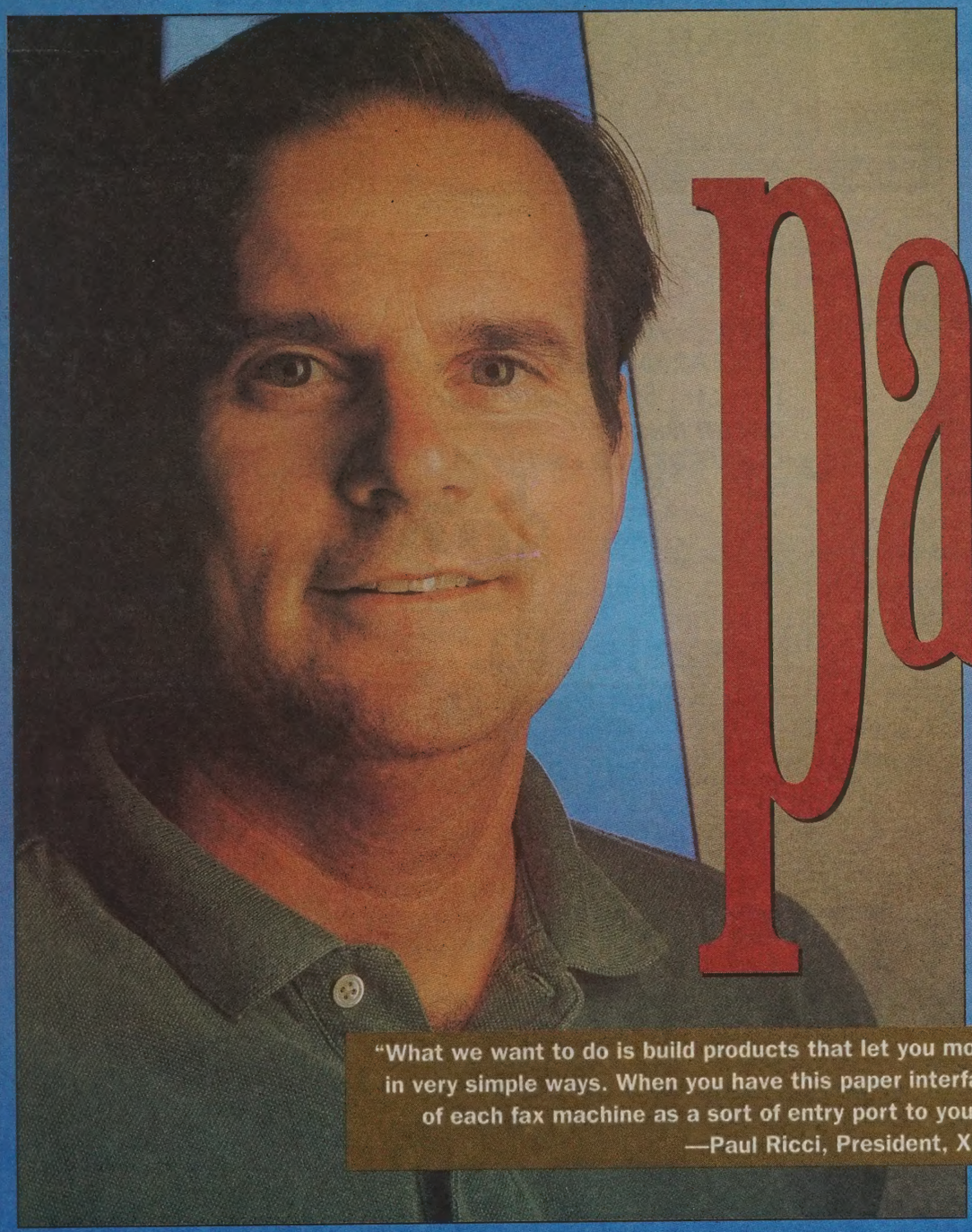

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Story starts on page 108

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Story starts on page 140

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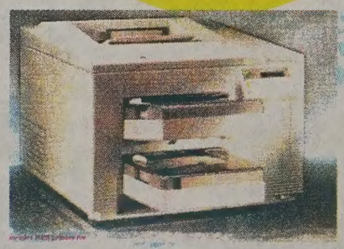

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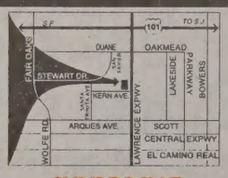

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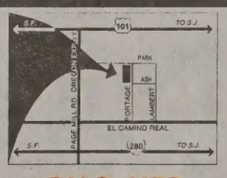

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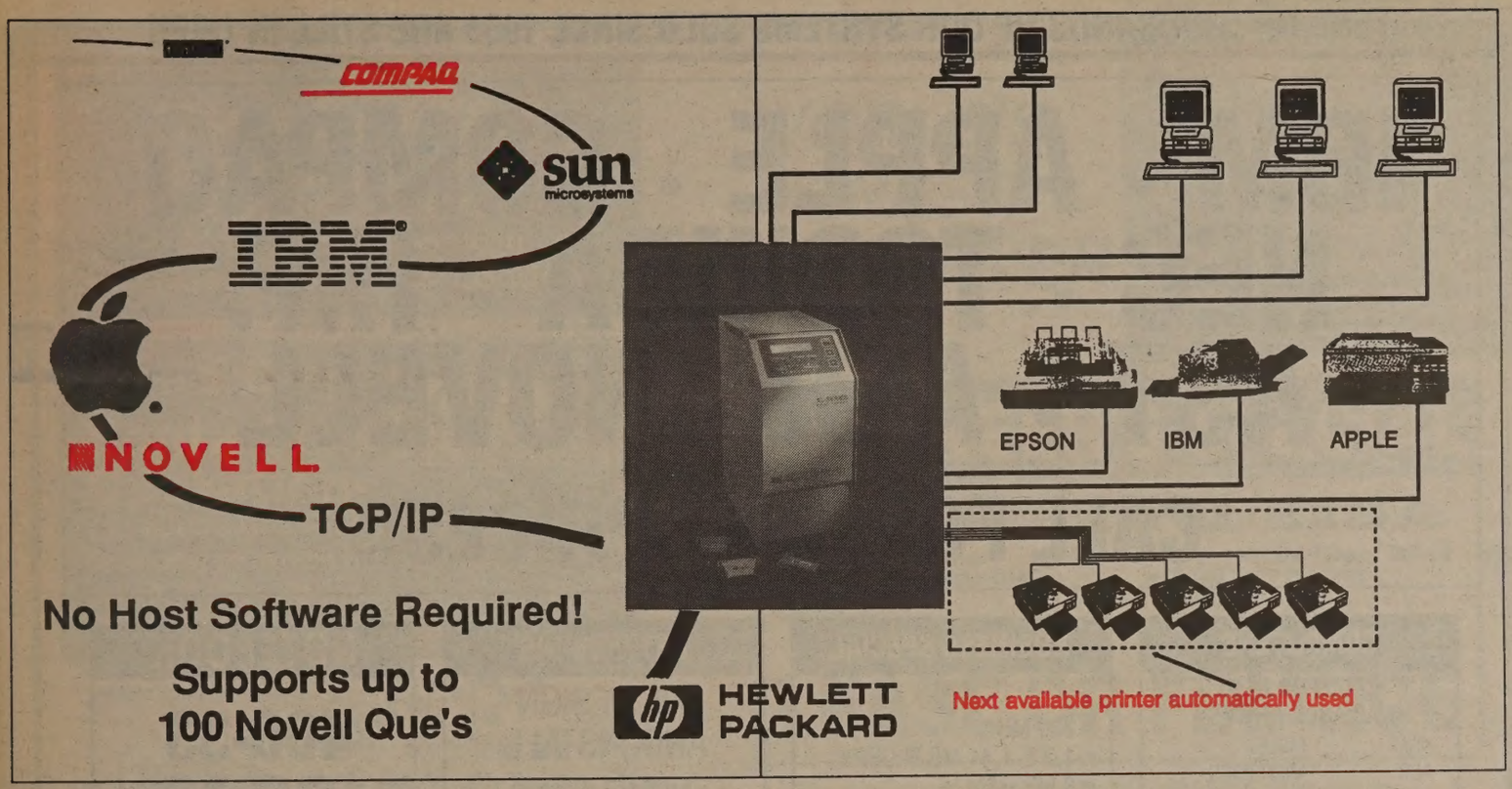

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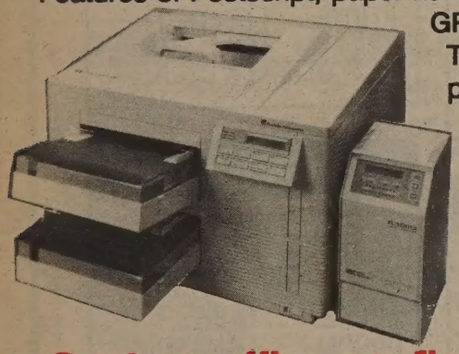

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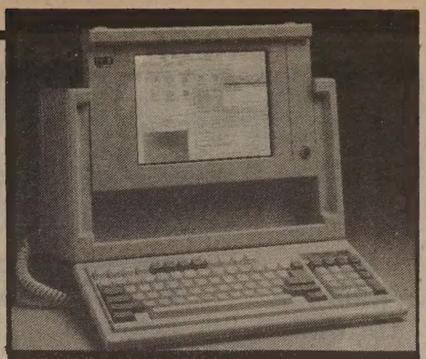

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AUG. 3, 1992 ISSUE #98
MICROTIMES

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A NOTE FROM THE EDITORS

Xerox has acquired a certain reputation for technological innovation over the years, particularly at its world-renowned Palo Alto Research Center. PARC technology has also acquired a certain reputation for forming the foundation for other people's successful startups.

Xerox's new Advanced Office Document Services division aims to take some of that PARC technology and turn it into successful products for Xerox. We think its first offering, PaperWorks, is a promising beginning.

While using paper as a computing platform may be the most radical notion in this issue, we're also happy to present some more "multiplatform" ideas, from Rich Grace's article on a unique Mac/PC/Amiga configuration to Lenny Bailes's discussion of DESQview-X. We hope you'll find the information useful.

—ME

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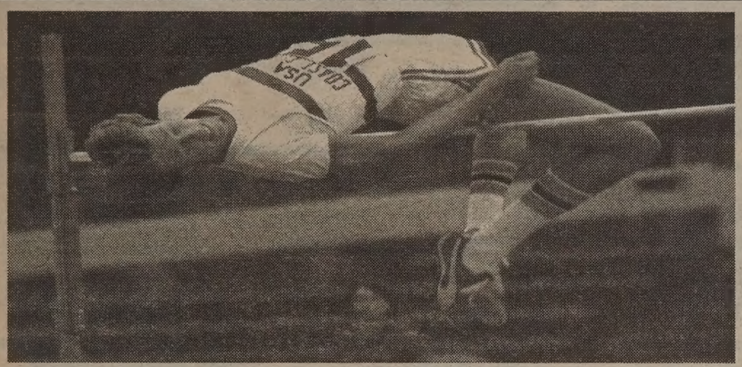
Challenge the Limits !



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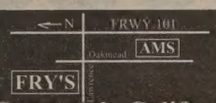

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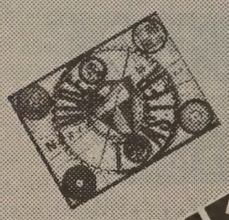

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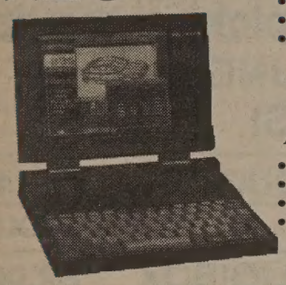

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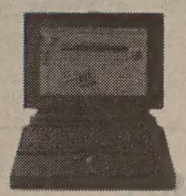

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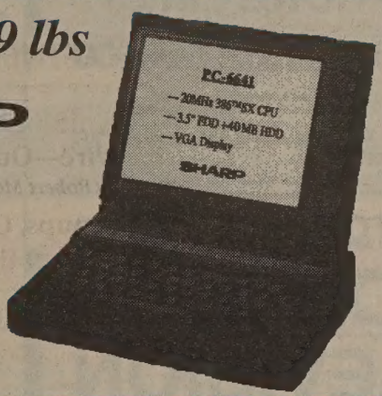

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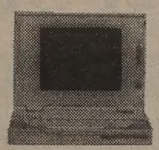

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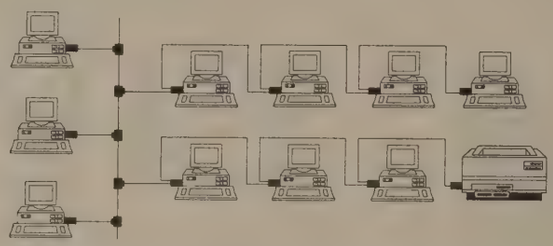

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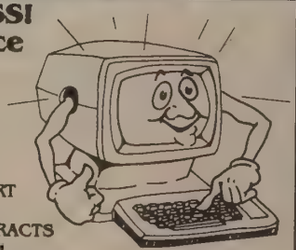

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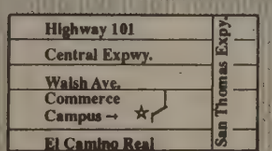

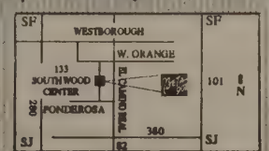

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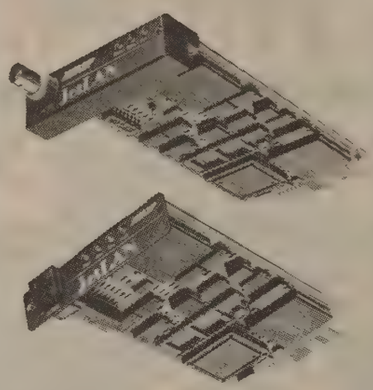

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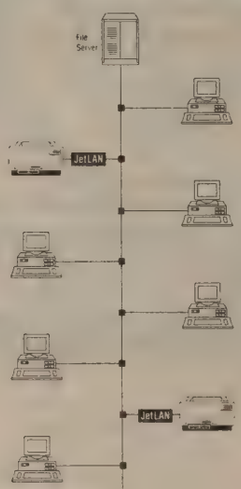

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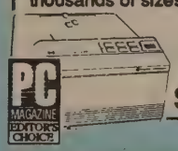

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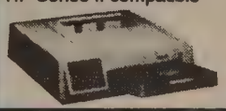

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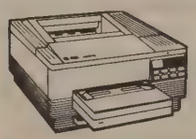

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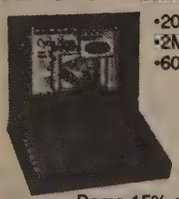

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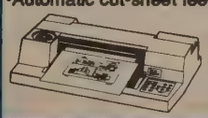

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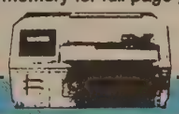

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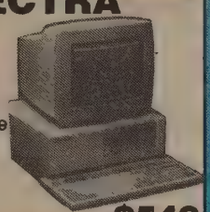

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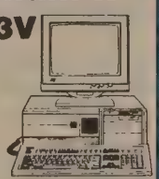

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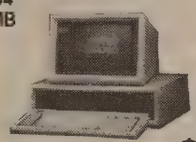

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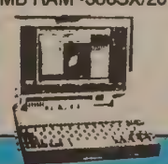

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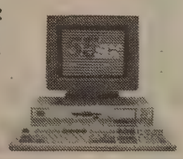

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OS/2: ANOTHER VIEW

I feel the need to take issue with Paul Hoffman's review of OS/2 2.0 [Issue #96N/#97S]. First, Mr. Hoffman states that IBM does not provide good service to the "small user." I called their 800 tech support line, and although their system is a little unique, I found their support to be fast, friendly, and knowledgeable. Certainly no worse than Microsoft and much better than Quarterdeck, both of which are toll calls. However, I do believe that IBM's policy of limiting free support to 60 days is a very bad move!

Installation: [Mr. Hoffman writes:] "One humorous note is you must do the installation from your A drive." Has Mr. Hoffman ever tried to install DOS from the B drive? Has he ever tried to install DOS? I also feel that Mr. Hoffman's complaints concerning the number of disks that must be loaded to add features to OS/2 is nothing but pure nit-picking.

Driver Problems: 1. While it would have been nice if OS/2 2.0 included Stacker, I feel that blaming IBM for other companies not having their products available sooner is just plain silly.

2. I have an Adaptec 1542B SCSI controller, and OS/2 immediately and automatically installed the correct driver, which has worked flawlessly! Obviously if the driver works for me and thousands of others, there is nothing wrong with the driver. Perhaps Mr. Hoffman has a conflict between his controller and another card. While DOS will allow interrupt sharing, OS/2 will not.

Perhaps Mr. Hoffman was not aware that most software includes a readme file filled with information that was not ready in time to be included in the manual. Hopefully he will be less shocked the next time he is referred to one.

The User Comes Last: Was this written by Bill Gates? This drivel about IBM tech support attitudes and OS/2 being different from Windows is pure silliness. You mean OS/2 doesn't have a screen saver? Come off it! Who cares about the mediocre screen saver in Win 3.1? What I like about OS/2 2.0 is its great interface and the fact that I haven't had a UAE or GPF since I installed it. Can you say that about Windows?

Steve Hollingsworth
Fax

WINDOWS 3.1: TWO VIEWS

Having recently purchased the 3.1 upgrade for Windows, I share much of Mr. Spisak's disappointment [Letters, Issue #96N] with the program. One of the first shortcomings I noticed was the absence of a new Microsoft mouse driver upgrade. Believing that obtaining one would be relatively painless, I called Microsoft product support. After spending the usual time on hold, I was told by a Microsoft represen-

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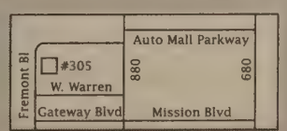

tative that I would have to talk with the sales department about an upgrade. When I called the sales division, I was informed that yes, a new mouse driver was available, but that I would have to pay $25 to obtain one through mail.

Since I purchased the entire Windows 3.1 upgrade for $39, I did not feel that spending $25 on a single driver was justified. Not only did Microsoft fail to provide its users with the driver in its upgrade package, but it now attempts to extract an absurd and outrageous price for one.

Luckily, I purchased my mouse from Logitech and was able to obtain a new mouse driver through them.

Krzysztof K. Pierscieniak
San Francisco

I'm writing because I don't want anybody scared off of Windows 3.1 by Daniel Spisak's letter. Win 3.1 may indeed require 5MB more disk space than 3.0—I had the two installed quite a while apart so I didn't benchmark them against each other. With hard disk real estate going for less that $4 a meg, that's cheap enough for a meaningful upgrade.

Windows 3.1 is being reported on in the computer media as primarily a bug fix, but if my experience reflects the general case, it's much, much more than that. With Windows 3.0 installed as a "pure" environment, meaning with HIMEM.SYS and SMARTDRV rather than third-party equivalents, I got two or three Unrecoverable App Errors a day. With Win 3.1 I've had, probably, one General Protection Fault a week—all of them caused by hastily written shareware or by old balky DOS apps, rather than by Windows itself. And when 3.1 hands me an error, I can close *that partition* and go right on with the rest of what I was doing. Win 3.1, very unlike 3.0, will even run the old GEM version of Ventura Publisher as a task. 3.1 is more stable than 3.0, more stable (for me) than DESQview, and more responsive than a couple of other competing windowing environments.

My bottom-line, no-bull cost for upgrading to Win 3.1 from a DOS character-based environment was $700, for a new hard disk and a bale of software. That's a piece of change, but a fair price for the first multitasking system I've ever had that works every day. Thanks to the vastly improved new version of SMARTDRV, I didn't have to upgrade my computer, which is a 386DX-16, hardly a rocket by today's standards.

Mr. Spisak reminds me of the people who complained when Lotus 1-2-3 first appeared and unashamedly required more RAM and disk space than most people had in their IBM PCs. Yes, the upgrade was expensive, but it didn't put a dent in 1-2-3's eventual popular-

continued on page 258

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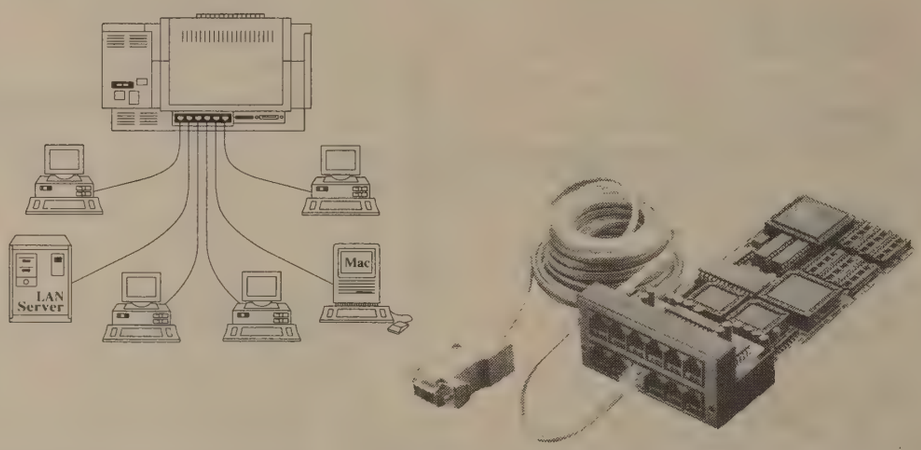

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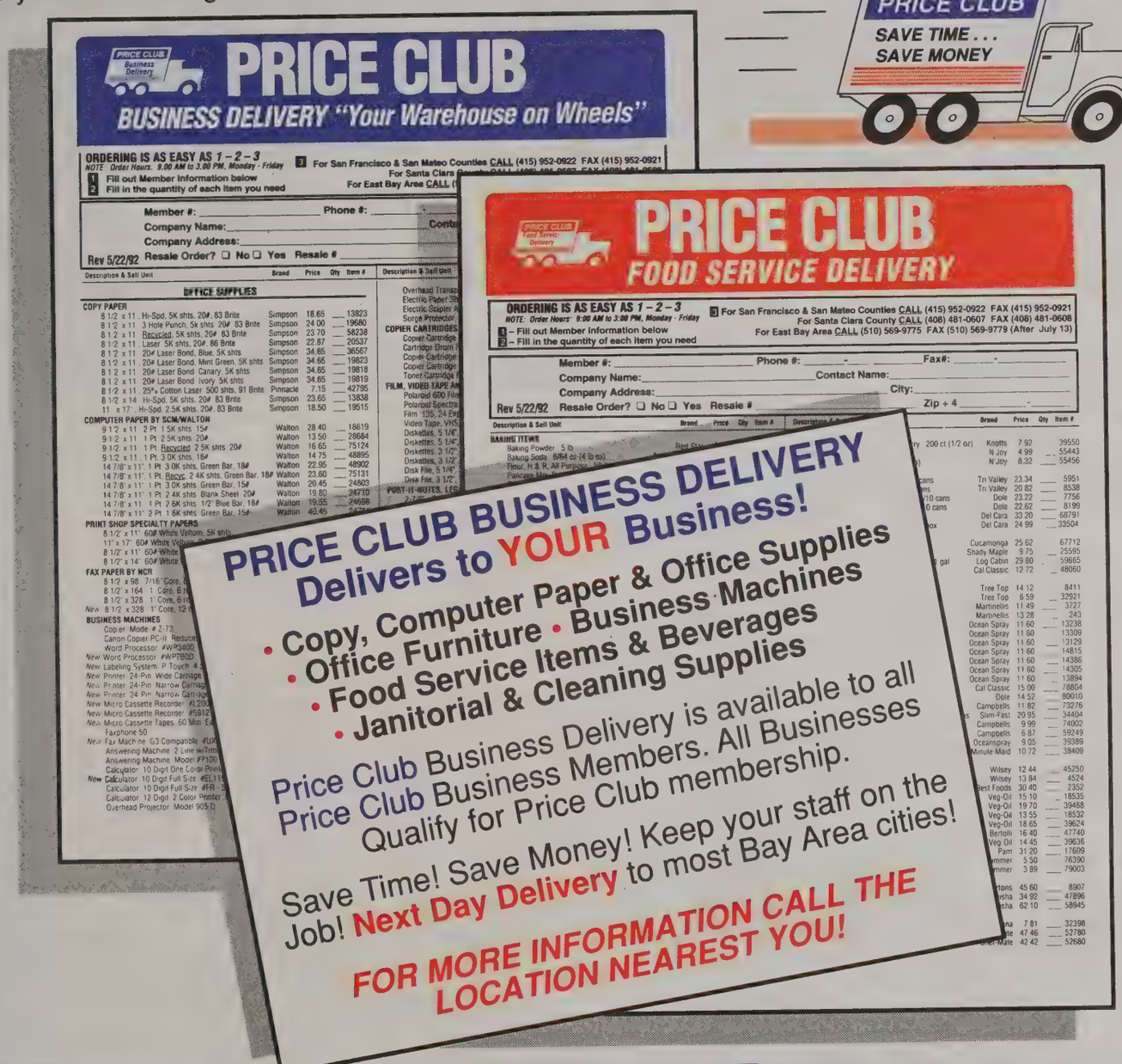
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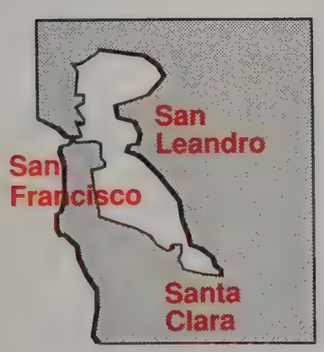

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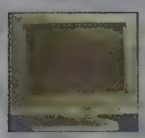

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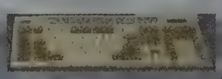

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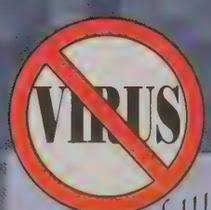

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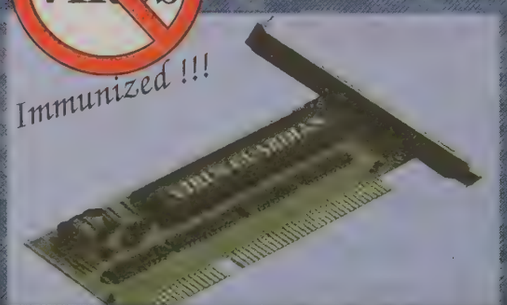

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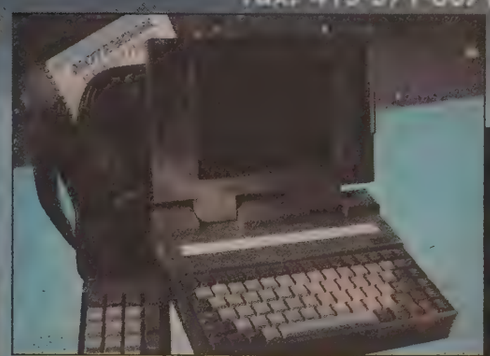

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INDUSTRY INSIGHT

Intel Announces New Standard, PC Prices Plunge, IBM And Microsoft Reach OS Agreement

BY PAUL HOFFMAN

INTEL'S PCI STANDARD

Intel has announced its long-awaited Peripheral Component Interconnect (PCI) specification, and has immediately gained the wide support of nearly all of the PC manufacturers. PCI is a standard way to design motherboards so that speed-dependent peripherals such as graphics, network, and hard disk controllers can talk to the CPU at high speeds. In the last year, a few PC manufacturers have introduced non-standard graphics controllers on the motherboard and have achieved graphics speeds 10 times faster than standard SVGA.

The importance of PCI for high-end PCs should not be underestimated. Now that Intel has serious competition in the CPU market, the price of the high-end CPUs and even its future 586 (or whatever they will call it) will come down faster than in previous years. With the cost of the CPU dropping quickly, you will be more able to buy a machine with a high-end CPU sooner. However, the two most important speed bottlenecks (after the CPU), graphics and hard disk controllers, have not kept up with the CPU in price drops for fast systems. PCI will allow PC manufacturers to put very fast controller chips directly on the motherboard and thus drop the price of the fastest systems.

The peripherals that will benefit most from PCI are graphics controllers, LAN adapters, and SCSI hard disk controllers. With PCI, it is fairly easy to design a system with all three built onto the motherboard, running at full speed. The cost will be low because the additional peripherals will be able to talk to RAM memory without going through either the current bus (such as ISA, EISA, or MicroChannel). PCI will be a particular boost to multimedia PCs which suffer from slow speed due to the PC bus. With PCI, a manufacturer can design a multimedia PC with a SCSI controller (for the CD-ROM player), a video controller, and an audio controller directly tied to the CPU and to memory, eliminating the three worst bottlenecks in current multimedia designs.

With just a few chips, which are expected in the coming months, a manufacturer can also turn a bare bones PC with a 486 CPU into a fully configured workstation that runs at blinding speed. For example, it is expected that instead of having to buy a $400 high-speed graphics board for such tasks as CAD, you will pay about $100 more for a PCI-compatible system with the graphics built in. High-end systems that are used as network servers can also be made to run much faster for only a little money with the addition of a network controller and a SCSI controller on the PCI bus.

Look for the first PCI-compliant systems to be announced at CompuExpo and COMDEX this fall. Prices may initially be high, but they will drop quickly if the systems are popular.

MASSIVE PRICE DROPS IN PC MARKET

Almost every major name-brand manufacturer of PCs has dropped its prices 20–40% in the past two months. This sudden, massive decrease will have many ramifications for PC buyers.

Many people are kicking themselves if they bought a PC before the price drop, but the downward movement was completely unpredictable. Most industry analysts assumed that the first general market drop would happen this fall, when Intel dropped the price of its CPUs and the new models of PCs were announced at CompuExpo and COMDEX. The across-the-board drop in recent months is probably due to increased competition between big name mail-order houses, local stores selling major brands such as IBM and Compaq, and the recent proliferation of "super stores."

Not everyone is rejoicing about the price cuts, however. Retail stores will definitely feel the pinch as their profit per sale plummets in the coming months. Unless they can make up for the lost revenue in greater sales, their total profits will sink drastically and some will be forced to shut down. Even those who remain healthy will have to rapidly increase the number of systems sold in the short run. This will put pressure on their customer service departments, who will have to deal with more dead PCs than before (few people believe that the quality of the average PC has gone up in the past few years). Hiring qualified technicians is already difficult, and it may become even worse in the coming months.

For buyers, of course, the news is all good. Because many major brands dropped their prices, most stores will have to drop prices across the board or specialize exclusively in the brands with the

Despite the number of sales of Windows 3.0, Windows 3.1, and OS/2 2.0, most people still prefer plain old MS-DOS.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) or CompuServe (71545,346)". He also writes popular microcomputer books.

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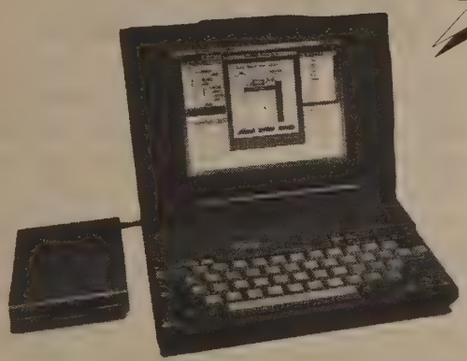

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continued from page 20

best quality/price ratio. The prices of many peripherals such as SVGA monitors and high-speed modems have also been dropping consistently, so complete systems should see the same drop as bare bones ones. This bodes well for anyone who wants to buy a computer in the next few months. It is now less clear how much the anticipated CPU price drops will affect system prices, but expect another round of price cutting before the end of the year due to lower CPU costs.

The most significant problem with this picture is the recession. PCs are bought mostly by small companies, and small companies are still hurting badly. There is not much that can be done for the economy, even in an election year, that will spur computer sales in the coming months. If you don't have much money to spend on a PC, it doesn't really matter if the price has dropped. In other countries whose economies are better than the that of the US, these price drops are more likely to cause greater sales. Here, however, it is not clear whether these price cuts will cause much of an increase in system sales. If sales don't go up, expect to see particularly hard times for all computer dealers.

MICROSOFT AND IBM AGREEMENT ON OPERATING SYSTEMS

In a move sure to put many purchasers' fears to rest, Microsoft and IBM have agreed on how they will use and sell MS-DOS, Windows 3.1, and OS/2 for at least the next year and a half. The agreement makes it easier for IBM to sustain OS/2 in the long run, much to the relief of many corporate PC buyers. In addition, the agreement clarifies Microsoft's role as the prime mover of Windows (beginning with version 4) and Windows NT. Although neither side was willing to admit it, they both scored significant victories with their primary markets.

The main points of the agreement are:

•IBM has full rights to all versions of MS-DOS until September 1993. At that point, it will either have to come up with its own DOS, rely on Microsoft to sell MS-DOS to its clients, or sell a DOS equivalent such as DR DOS.

•IBM can continue to use Windows 3.1 source code in its products and can sell Windows 3.1 as an OEM. It is unlikely that it will have those rights for Windows 4.

•IBM can sell Windows NT on IBM hardware, but it loses the right to modify or incorporate Windows NT source code. It can view the Windows NT source code, which can possibly lead to an NT-compatible operating system (although this is unlikely).

•Microsoft and IBM will exchange all current software and many hardware patents, as well as those awarded in the next five years. Microsoft had to pay a reported $10–20 million for these rights because IBM holds so many more patents than Microsoft.

•Both companies will work together (yeah, right...) to give Windows better access to mainframes.

The agreement has many long-term effects that will change the way people view PC operating systems. Because MS-DOS is still by far the most popular operating system, Microsoft's control of it is crucial for the long term. Despite the number of sales of Windows 3.0, Windows 3.1, and OS/2 2.0, most people still prefer plain old MS-DOS.

Microsoft will soon be in the position of being the main driving force behind improvements to MS-DOS. Although it has spent much more money promoting Windows, MS-DOS still makes up a sizable proportion of Microsoft's annual profits.

After September 1993, IBM will still be able to provide its customers with MS-DOS or an equivalent. It can either license future versions of the program from Microsoft, continue to include the last version available under the old terms (much as many companies did with version 3.3 until version 5.0 came out), or invest in creating an MS-DOS compatible operating system. With its recent links to Novell, the new owner of DR DOS, IBM may actually save money by distributing DR DOS instead MS-DOS. That may sound farfetched now, but remember how few people thought that end users would be willing to buy a 386 manufactured by AMD and how unimportant the manufacturer turned out to be in customers' minds.

IBM is also guessing that people will not demand Windows 4 compatibility in future versions of OS/2, and that is probably a safe bet. Given the large number of people who have not upgraded from Windows 3.0 to 3.1, it is safe to assume that Windows 3.1 compatibility will be sufficient for many years (note that OS/2 version 2.0 still only comes with Windows 3.0). This will probably lock in Windows 3.1 as the target for most Windows software in the next three or four years.

Microsoft gained a great deal from the agreement as well. Now, no one will wonder how much effect IBM will have on Windows NT: it is clear they will have next to none. The success or failure of Windows NT is now totally in Microsoft's hands.

Microsoft recently released the first almost-full versions of

High Tech News from Japan

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

•**Fujitsu** and **Apple Computer** are negotiating an agreement by which Apple licenses its QuickTime software for use in Fujitsu's popular "FM Towns Series." Fujitsu had apparently been interested in Microsoft's MPC technology, but has decided that QuickTime, recently licensed to Silicon Graphics, will dominate the multimedia field.

•**Olivetti Japan** has begun shipping a PC based on a 50MHz version of the MIPS R4000 RISC processor. The system will run either Windows NT or UNIX System V Release 4.

•**Lotus Japan** is shipping a new version of its "Harmony" integrated software package, co-developed with Just Systems, in both floppy-disk and IC card versions. The software combines Just Systems' Ichitaro word processor with database, and spreadsheet and memo functions.

•**Sharp** has announced that it will release an English-language pen-input electronic notebook in Europe and the US early next year. This is the first product developed in cooperation between Sharp and Apple Computer, and differs considerably from Apple's recently announced Newton

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TOSHIBA T6400SX/120MB W/ 20MB RAM	$4830
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COMPAQ LITE/20 & LITE/25 8MB	$336	***NEW!***
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COMPAQ SLT/386S 4MB	$218	
COMPUADD COMPANION/SX 2MB (70ns)	$58	
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GRID 1720/1750 2MB	$88	
IBM N33SX 2MB/4MB (70ns LP)	$98/$158	
IBM CL57SX 4MB/8MB (70ns LP)	$288/$540	***NEW!***
IBM N51SX/N51SLC 2MB/4MB/8MB	$CALL	***NEW!***
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PANASONIC CF170/270/370 1MB/2MB	$58/$88	
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TOSHIBA T3300SL 2MB/4MB/6MB	$126/$175/$340	
TOSHIBA T4400/T6400 2MB/4MB/8MB	$148/$216/$398	
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NEC SILENTWRITER 2 MODEL 90/290 /S60/S60P 2MB	$138	
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NT to developers, and people who have worked with it and OS/2 claim that Windows NT will be much more popular than OS/2 for many technical reasons. NT offers most of the major features of OS/2, has better networking capabilities, and is much closer to the Windows user interface. Companies that need file servers will look long and hard at NT, which may preclude enough sales of OS/2 to hurt IBM in the long run.

In this sense, the agreement is a win-win situation for the companies and their customers. It means that you will be better able to predict the long-term success of a particular operating system before you buy it, and hopefully will read less about sniping between the two companies. It allows them both to try to woo hardware vendors and software authors to support their operating systems based on the merits of the systems instead of the fear of the future. The biggest unknown about the contract is what advantage either side will be able to take of the patent cross-licensing.

MICROTIMES STOCK INDEX

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 06/05/92	CLOSING PRICE 07/02/92	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH	ANNUAL P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	46.38	44.75	-1.63	-3.50	19	0.32	0.72	68.50	37.50
OTC	Aldus	L)	ALDC	20.50	13.00	-7.50	-36.59	9	0.00	0.00	45.50	11.50
OTC	Autodesk		ACAD	36.00	37.13	.13	3.13	18	0.48	1.29	57.25	23.25
OTC	Borland	(L)	BORL	51.75	41.00	-10.75	-20.77		0.00	86.75	37.75	
OTC	Informix		IFMX	33.50	29.00	-4.50	-13.43	17	0.00	0.00	36.00	5.50
OTC	Lotus	(L)	LOTS	28.38	18.25	-10.13	-35.68	14	0.00	0.00	40.75	17.75
OTC	Microsoft	(s)	MSFT	80.67	69.88	-10.79	-13.38	32	0.00	0.00	88.84	40.34
OTC	Novell		NOVL	56.00	53.75	-2.25	-4.02	39	0.00	0.00	65.00	23.88
OTC	Oracle		ORCL	15.50	16.88	1.38	8.87	38	0.00	0.00	21.13	7.88
OTC	Software Publishing	(L)	SPCO	13.88	8.88	-5.00	-36.04	0.00	0.00	26.25	8.25	
OTC	Symantec		SYMC	42.25	37.50	-4.75	-11.24	50	0.00	0.00	51.00	21.88
	HARDWARE											
OTC	Apple		AAPL	54.88	46.25	-8.63	-15.72	17	0.48	1.04	70.00	41.75
OTC	AST Research	(L)	ASTA	17.63	13.88	-3.75	-21.28	6	0.00	0.00	32.25	12.00
NYS	Commodore	(L)	CBU	1.75	10.13	-1.63	-13.83	6	0.00	0.00	19.25	9.50
NYS	Compaq		CPQ	28.75	24.50	-4.25	-14.78	35	0.00	0.00	37.50	22.13
NYS	Digital Equipment	(L)	DEC	40.50	33.75	-6.75	-16.67		0.00	1.75	33.25	
OTC	Dell		DELL	23.13	17.75	-5.38	-23.24	11	0.00	0.00	29.00	13.91
NYS	Hewlett-Packard		HWP	72.38	66.88	-5.50	-7.60	18	0.80	1.20	85.00	44.63
NYS	IBM		IBM	90.38	96.88	6.50	7.19	4.84	5.00	106.38	81.63	
NYS	Silicon Graphics		SGI	17.63	17.50	-0.13	-0.71	22	0.00	0.00	29.75	14.00
OTC	Sun Microsystems		SUNW	26.50	26.13	-0.38	-1.42	13	0.00	0.00	35.88	20.75
NYS	Xerox		XRX	74.00	69.75	-4.25	-5.74	17	3.00	4.30	82.25	52.63
NYS	Tandy	(L)	TAN	28.13	23.25	4.88	-17.33	11	0.60	2.58	31.25	23.25
	CPU'S											
NYS	Advanced Micro Device	(L)	AMD	15.00	7.63	-7.38	-49.17	3	0.00	0.00	21.50	.63
OTC	Intel		NTC	50.00	5.88	5.88	11.75	15	0.00	0.00	68.75	38.50
NYS	LSI Logic	(L)	LSI	7.13	6.75	-0.38	5.26	45	0.00	0.00	9.88	5.88
NYS	Motorola		MOT	82.25	76.63	-5.63	-6.84	22	0.76	0.99	83.75	54.0
	COMMUNICATIONS											
NYS	AT&T	T		42.13	43.88	1.75	4.15	93	1.32	3.01	44.63	2.88
NYS	BellSouth Corp.		BLS	47.75	49.75	2.00	4.19	15	2.76	5.55	52.63	43.38
OTC	MCI		MCIC	32.25	32.25	0.00	0.00	16	0.10	0.31	36.13	25.25
NYS	Northern Telecom	(L)	NT	9.50	37.00	-2.50	-6.33	18	0.32	0.86	49.25	34.13
NYS	Pacific Telesis		PAC	40.88	40.75	-0.13	-0.31	15	2.16	5.30	45.00	36.88

Notes: Microsoft completed a 3-for-2 stock split. MIPS merged with Silicon Graphics and was removed from our list.

KEY: NYS = NEW YORK • ASE = AMERICAN • OTC = OVER THE COUNTER • (H) = NEW HIGH REACHED IN PERIOD • (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	6
DECLINES	25
UNCHANGED	1
NEW HIGHS	0
NEW LOWS	11

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	IBM	$ 6.50
SMALLEST DOLLAR LOSER	Microsoft	$ -10.79
LARGEST PERCENTAGEGAINER	Intel	11.75 %
SMALLEST PERCENTAGE LOSER	Advanced Micro Devices	-49.17 %

CLOSING QUOTES:

	CLOSE 06/05/92	CLOSE 07/02/92	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH
MICROTIMES STOCK INDEX	3562.74	3182.43	-380.31	-10.67
DOW JONES INDUSTRIAL AVERAGE	3398.69	3330.29	-68.40	-2.01
STANDARD & POOR'S 500 STOCK INDEX	413.48	411.77	-1.71	-0.41
N.Y.S.E. COMPOSITE	227.88	226.41	-1.47	-0.65
NASDAQ COMPOSITE	585.43	563.35	-22.08	-3.77

DATE	MICRO TIMES	DOW JONES
12/12/91	3254.85	2895.13
01/20/92	3961.41	3254.03
02/14/92	3984.10	3245.97
03/13/92	3888.19	3235.91
04/10/92	3566.89	3255.37
05/08/92	3642.36	3369.41
06/05/92	3562.74	3398.69
07/02/92	3182.43	3330.29

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TECH WRECK TAKES TOLL ON COMPUTER STOCKS

Tremors of another nature rumbled through the high tech sector during the month of June, as investors took technology stocks to the woodshed following an onslaught of unexpectedly negative earnings news.

And nowhere was the beating more severe than in the MicroTimes Stock Index, which surrendered 380.31 points, or 10.7% before bottoming out at 3182.43—an eight-month low for our index of 32 stocks tracked in the accompanying table.

In a bit of irony, computer stocks were victims of computer trading during the month, as the burgeoning price war in the personal computer industry sent shock waves through Wall Street. Such stiff competition on price took its toll on the following concerns last month: Apple (down 15.7%), Compaq (off 14.8%), and Dell (down 23.2% to $17.75), among others.

IBM, on the other hand, dodged the sell-off and continued its recent positive run, as shares in the firm once again led all dollar-gainers in our index. For the period, shares in the company gained $6.50 before ending at $96.88. The rise came on positive recommendations from Wall Street analysts, many of whom raised their earnings estimates for IBM during the week. Separately, a *Wall Street Journal* profile said insiders were net buyers of IBM stock for the first time in two years.

Microsoft split its shares 3-for-2 last month in an attempt to make its shares more affordable to investors. Brokerage firms lowered their short-term ratings on the company last month to "hold" from "buy" after a strong rally in Microsoft's stock price. The result: Microsoft was the largest percentage casualty of the lot last month, as it toppled $10.79 a share to $69.88.

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PowerBook 140, 4RAM, 80MB HD	Low Price
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PowerBook 170, 2RAM, 80MB HD	Low Price

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Personal LaserWriter NTR	$1,657
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Hewlett-Packard ScanJet IIC for Mac	$1,299
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NEC

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Desktop Publishers' Missing Machine

The Online Presidential Debate

BY JIM WARREN

These are "fantasies" only because we've not yet implemented 'em.

ONLINE PRESIDENTIAL DEBATES

I have asked the major presidential candidates to join in an online debate using the global Internet—in their spare time, spread over one or several weeks.

REALIZABLE FANTASIES

The **Clinton** campaign has agreed to participate, subject to "scheduling availability."

The **Perot** campaign's Dave Meyerson said they are getting their computer operation organized. They did not seem interested in using a CompuServe (CIS) or America OnLine (AOL) account or any of the low-cost accounts on commercial Internet hosts — such as the other campaigns are using.

The **Bush-Quayle** campaign's press secretary, Torie Clark, wrote that the proposal was "very interesting," adding that Bush gets "thousands of noteworthy requests every week, and unfortunately he cannot accommodate every one." He was passing it along to their director of communications for review.

Within three weeks of my invitation—and before the June primaries—the Clinton, Brown, and Marrou (Libertarian) organizations had agreed to participate, but no other major player had signed on. (Immediately after those primaries, Buchanan went in for heart surgery.)

Copyright © 1992 by Jim Warren, 345 Swett Rd., Woodside, CA 94062; email/jwarren@well.sf.ca.us. Permission herewith granted to copy-in-full for nonprofit purposes. *Jim Warren founded* InfoWorld, *the DataCast proposal for paperless electronic newspapers, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various computer trade and professionals organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics and statistics.*

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1992), sponsored by a dozen nonprofit and industry organizations, received one of the first Electronic Frontier Foundation Pioneer Awards (1992), and is a member of the board of directors of Autodesk, Inc.

AUDIENCE IS BIG ENOUGH

Recent analysis indicates eight to fifteen million people are networked through about 1.3 million computers, connected to the co-op-style Internet. Users include many of the nation's national, regional, state, and local community leaders, decision makers, and opinion makers.

One to three million use the free, worldwide, co-op "paperless newspaper" and bulletin board known as USENET, available over most of Internet and other nets—on which the debate and related global discussion are proposed to take place.

Many pay nothing for Internet and USENET access—through work, school, or the tens of thousands of microcomputer BBSs that carry USENET. Others pay $15–$20 per month—about half the cost of a premium cable TV channel—to use one of the numerous low-cost or nonprofit host-computers that include Internet access.

CompuServe Information Service (CIS) and America Online (AOL) could access the debate and discussion via volunteers from among thousands of people who have dual access—using both an Internet host and CIS or AOL. (CIS and AOL now have gateways to the Internet.)

"Plodigy," however, seems content to keep its users disconnected from the rest of the increasingly networked world.

ADVANTAGES OF ONLINE DEBATE

• Discussion via publicly-networked computers negates "schedule conflicts." Participants can post questions and comments at any time from any place—via phone or wireless connection, with no more than a laptop-with-modem.

• The audience is global. One need not be "present"—online—during the debate, nor be in the same nation. Interested citizens don't even have to successfully program their VCRs.

• Candidates' comments and responses need not be limited by time or length. They can make brief statements—all that's possible in a time-limited live debate. But they can also post complete position statements.

• Candidates can take several days in which to draft concise, complete, factual responses to questions. They can consult advisors—just as any president would be expected to approach any important issue. The idiotic pretension of instant expertise on all issues—essential in face-to-face debates—is unneeded.

In an online debate, candidates' comments form a globally accessible permanent record.

• Candidates' comments form a permanent record, globally accessible, machine searchable for topics of interest by word or phrase. Reporters can get accurate and complete quotes—and citizens can verify accuracy and review context.

• Substantive responses—and the lack thereof—become obvious. Controversy over issues of fact are typically addressed within hours, from a global basis of knowledgeable individuals and researchers, with the complete discussion visible for all to see.

• The debate is more likely to focus on information and positions—not emotional posturing, coiffure, makeup and façade. (Who knows? If this catches on, perhaps someday even someone as homely as Abe Lincoln could again be elected president.)

• In parallel with—and long after—the debate, the global audience can discuss the candidates' comments, visible to the whole world via international public online forums; they can do this within small groups via private teleconferences, and one with another via personal email.

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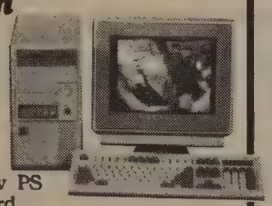

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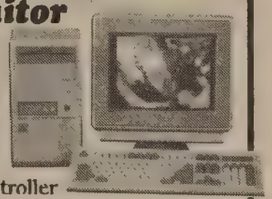

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Diamond Speed Star Hi-Color	$169
Paradise 1024x768/1M	$109
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Sony 1304s 1024x768 0.25	$569

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ESDI /SCSI HD	LOW

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BIG TOWER CASE W/230 WPS	$129
BLACK CASE W/PS	LOW

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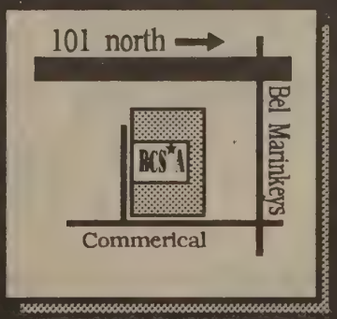

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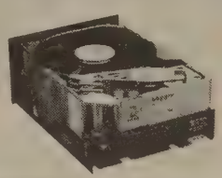

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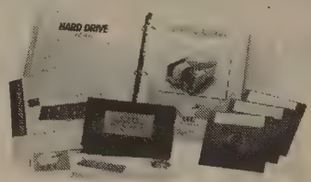

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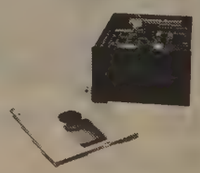

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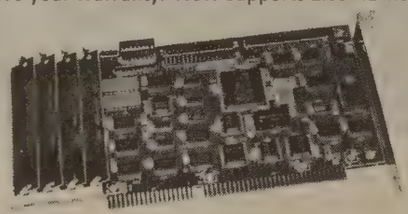

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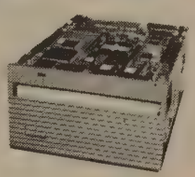

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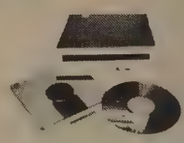

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Credit where credit's due: Of these major candidates, the Jerry Brown campaign was the first to respond, the first to use public computer forums as a campaign tool, and the first with "online presence" on multiple systems.

LOW-COST LABELERS FOR MODERATE MAILERS

We need desktop labelers that can label a few thousand pieces an hour—30–100 per minute, about 15,000–50,000 per workday. At prices comparable to HP's early LaserJets, perhaps as high as $3,000 to $5,000. Comparisons: Desktop folders cost under a kilobuck, are a bit larger than laser printers and can multiple-fold 11" x 17" sheets at hundreds per minute. Postage - stamping machines of similar price and size are even faster.

Desktop labelers should use ink-jet technology—for office quietness, image freedom and resolution, speed, reliability, and tolerance of varying papers and mailers.

The ink must *not* be water soluble. Otherwise rain, sleet and snow—and even sweat—may illegibly besmirch the postal person's appointed rounds.

Mass-market desktop labelers—like mass-market laser printers—can limit the sizes of pieces they can process. They should handle pieces as small as postcards, as large as 11" x 17" envelopes, and as thick as—say—MicroTim*es*' Northern California edition, e.g. a half-inch or more.

Their print heads should allow at least 0-, 90-, 180-, and 270-degree text orientation and print lines at least 8" or 9" long, located on almost any part of a potential 11" x 17" mailing piece. If necessary, orientation and location could require manual repositioning of the print head or print bar, just as pin-feed printers permit adjusting for paper width and position. Full-length, fixed 17" printbars should be available options.

They should print at least ASCII characters and Postnet bar codes, and should accept LaserJet and/or Mac QuickDraw commands. PostScript should be an economical option. (Forget TrueType, unless it someday offers substantial, permanent consumer benefits unavailable from PostScript. Let TrueType's proprietors pugilistically peddle their perverse products.)

SHARE WHERE? SHARE HERE!

Share spare techno thoughts with Realizable Fantasies so we can share 'em with everyone else. 345 Swett Road, Woodside, CA 94062 or email to jwarren@well.sf.ca.us. Published proposals will be attributed to their authors, unless anonymity is requested.■

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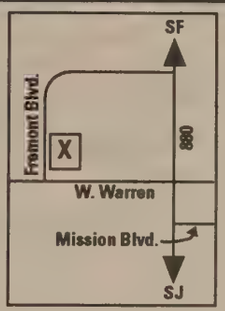

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Pens And Palmtops: An Overview

BY MITSU HADEISHI

Two new niches in personal computing are likely to be very closely intertwined in the near future, and this column is intended to cover both of them: pen-based and palmtop computers.

Currently, pen computers are being sold primarily into vertical markets, mostly commercial special-purpose applications such as point-of-sale data entry; they are usually tablet devices that weigh 4to 6 lbs. and cost several thousand dollars.

Palmtops have been a mass-market item for several years now, and are becoming increasingly popular. Pen input is also a natural for the palmtop computer, however. In Japan, there are several pen-based palmtop computers, but the first commercial product to be released in the United States that supports pen entry has just been announced (the Sharp OZ-9600, the latest in the popular line of Sharp Wizard palmtops).

For personal use, palmtop computers can replace the ubiquitous "little scraps of paper" that we all tend to scribble important phone numbers on, and which are inevitably recycled long before the day you're actually looking for that piece of information. Palmtops have a number of advantages over this tried-and-true system: all the information is located in a single, known location, and most palmtops have a number of different convenient techniques for backing up the valuable data (a lot easier than trying to Xerox your address and appointment books).

Pen computers go a step further. Now you can literally jot down the information straight into your computer, rather than writing it down on a scrap of paper and then copying it into your palmtop.

THE ULTIMATE IN PORTABILITY

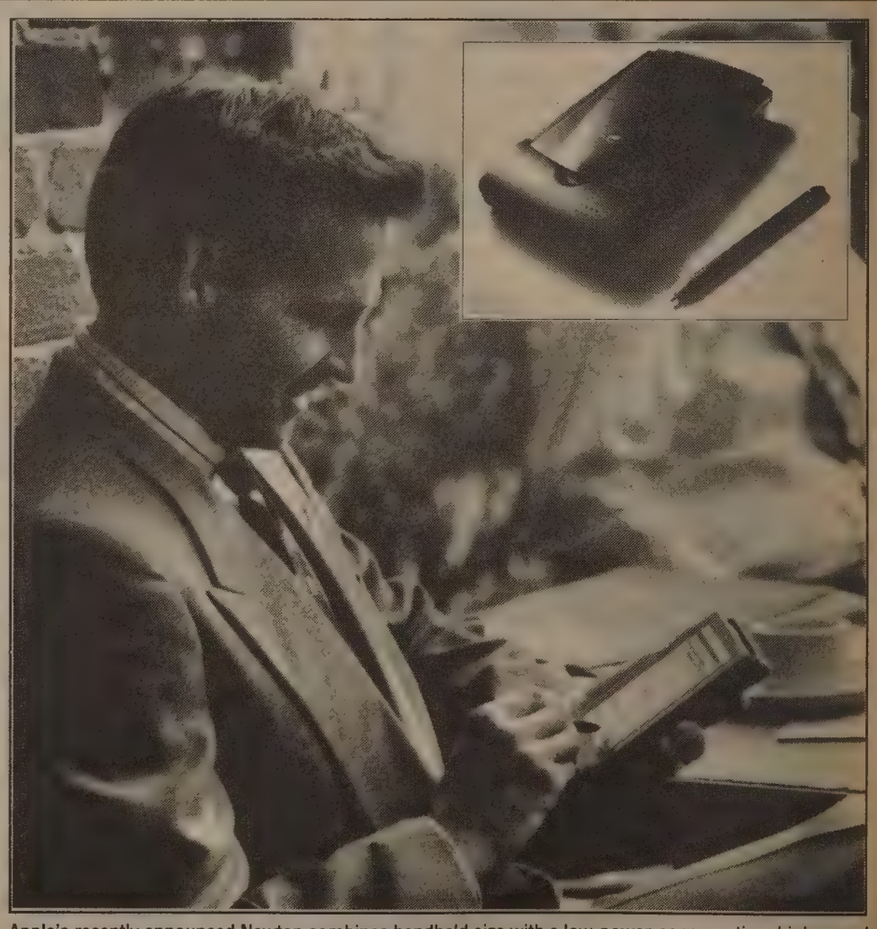
Palmtops go even further than notebook computers in terms of miniaturization. They are the Walkmen of personal computing. These machines are generally small enough to fit in a jacket pocket, sometimes small enough for a pants pocket. They aren't nearly as powerful as the notebook machines, but they offer the ultimate in portability and are even less obtrusive than a notebook computer. The batteries in many of the units can last for hundreds of hours of continuous use, and you can take them practically anywhere. And as power-saving technology and miniaturization technology improve, the power of the palmtop machines will rapidly increase.

In this month's column I will briefly describe several of the palmtops that are currently available or are planned for release soon. Over the next several months I will be covering these in depth, as well as discussing machines that have been announced or that will be available soon in the United States. (A number of palmtop computers have been released in Asia already, but are not yet available on a mass-market basis in the States.) I will also be covering pen-based computers at length. However, for now, the primary focus will be on machines available to the mass-market consumer.

STANDARDS

A brief note on emerging standards in the palmtop industry. The most important standard to keep in mind is called the PCMCIA standard. This is a hardware standard that allows any PCMCIA-compliant palmtop computer to talk to a PCMCIA-compliant memory card or expansion card. Currently, the most widely available PCMCIA cards are memory cards, which are indeed interchangeable among different palmtops which conform to the standard.

In addition, many palmtops are adopting



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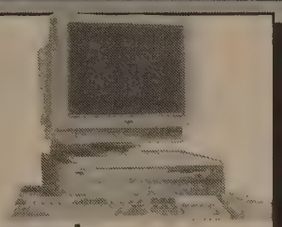

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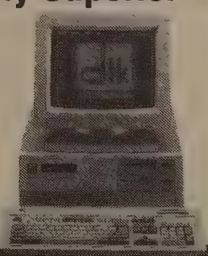

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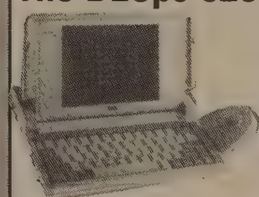

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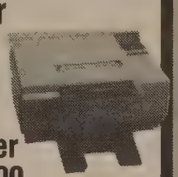

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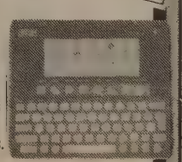

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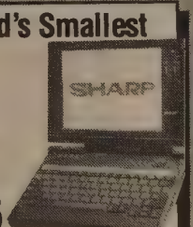

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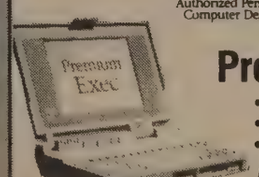

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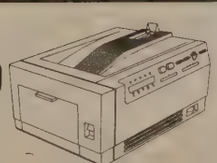

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DOS as their standard operating system. There are tradeoffs to using DOS rather than a special-purpose operating system: though running DOS allows the palmtop to run many third-party programs, DOS also eats up a lot of memory on these memory-shy palmtops (which typically have to use memory for both system RAM and simulated "hard disk" storage). Most palmtops, in addition, do not have a full 25x80 character screen, meaning that you either have to scroll around on the screen, or you have to get a special version of the program specifically designed for your palmtop screen size.

However, writing programs for DOS-compatible palmtops is generally a lot easier than on some of the others; you can simply write the program on your DOS machine, then download it into your palmtop, using whatever tools you find familiar (BASIC, C, C++, etc.)

FLASH RAM: LOOK OUT, SEAGATE

Flash RAM is already the standard for simulated hard disk storage in the palmtop domain. These cards are made up of EEPROMs (electrically erasable programmable read only memories). What this means is that you can change their contents with an electrical burst (thus the name "flash") and their contents remain even when the power is turned off. This makes them ideal for "simulated hard disk" storage in palmtop computers. Currently, the largest "Flash RAM" cards available for palmtops are in the 1–2MB range (and they cost around $400 for a 1MB card), but all this will soon change with the introduction of Intel's new 20MB Flash RAM card, announced this past April.

Intel's card is intended to retail for $700, only twice the retail price of existing 20MB 1.8" hard disk drives, and down considerably from the current price of Flash RAM cards, which are about ten times as expensive per megabyte as 1.8" hard disk drives. Initially, this will mean that palmtop computers will be able to store about ten to twenty times more information than they have been until now.

In addition, since semiconductor pricing is still falling at an exponential rate, the implications for the hard disk industry as a whole are vast: over the next several years as Flash RAM prices drop and reusability improves (the current Intel chips are supposed to be rewritable 100,000 times), the whole hard disk industry could become a thing of the past. If reusability improves and prices continue to drop past the level of hard disks, the market for hard disks of any size could simply evaporate. Flash RAM cards would not only be as cheap or cheaper than hard drives, they would be a lot faster and probably more reliable.

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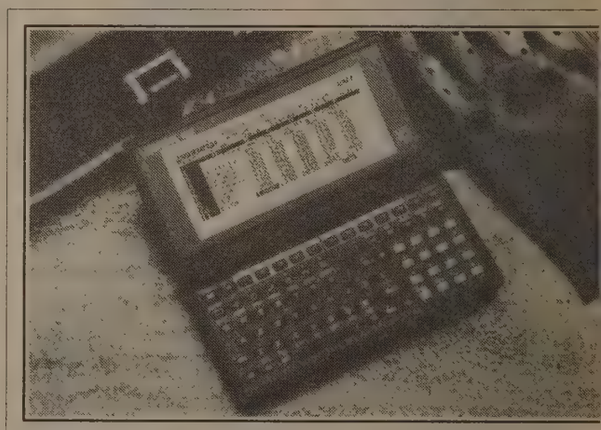
PALMTOPS IN A NUTSHELL

At the bottom of the palmtop market are the electronic organizers, the lowest end of these "portable personal information managers." Though the less capable of these units are not really powerful enough to be called palmtop computers (they are more appropriately termed "organizers"), the more advanced are quite capable and even expandable via card slots and communications ports. Thus they are generally considered to be competitive with their more expensive palmtop cousins. Most of these organizers include an address book, memo pad, scheduler, and world time/clock/alarm—what I call the "basic organizer functions."

The most popular line of electronic organizers is the Sharp series, currently holding the majority of the consumer market. These machines range from the Sharp organizers such as the $130 list ZQ-2400 (basic organizer functions, 64K of RAM, but no card slot), to a true palmtop computer line, the Sharp Wizard series (all of which have card slots), which includes the new $330 list OZ-7620 with 64K of RAM, the $400 list OZ-8200 with 128K of RAM and a larger screen, and the recently announced Sharp OZ-9600 with a very large 320x240 pixel touch screen, 256K of RAM, and most interestingly, pen input (price not yet available). Most of these machines have ports for connecting to a PC or a Macintosh and for communicating with each other. The card slot in these Wizard-class machines allows you to add such features as a spreadsheet, financial calculator, any of a number of travel guides and multilingual translators, extra memory, or even the BASIC programming language. These machines are sturdy and well designed. Sharp also has introduced a new palmtop DOS-based computer line, the PC-3000 series, which I will discuss in a future column in depth.

Casio offers electronic organizers such as the $80 SF-4300 with 4x16 character screen and 32K of RAM, and the $100 SF-5300 with a few more features and 64K of RAM. These machines are not expandable. The true palmtops offered by Casio start with the $300 list "Executive" B.O.S.S. SF-9500 with 64K of RAM to their new $450 SF-R10 with 256K of RAM, a large screen, and a built-in Lotus 1-2-3 compatible spreadsheet. Like the Sharp, Casio also offers a wide range of cards from a spreadsheet to a wine guide. Until the SF-R10, the Casio machines were considered to be a bit more clumsy to use and a little less well constructed than the Sharp machines. However, they tend to be priced a bit less than the Sharp machines, and thus can offer someone reasonable functionality for a bargain price.

The Psion Series 3 from Psion UK, a British company, is a very impressive new entry into the palmtop market. This unit retails for $549 and includes 256K RAM, two card slots (unfortunately not PCMCIA-compatible), an 8x40 character bit-mapped display, built-in serial port, a multitasking operating system, and several impressive built-in applications, including a Microsoft Word-compatible word processor (complete with multiple fonts, styles, and even style sheets), the usual organizer functions implemented in a very user-friendly manner, and even a built-in programming language. The unit uses a graphical user interface (driven from the keyboard) which is much more aesthetically pleasing than most palmtop computers offer. The only drawbacks to this unit are a slightly mushy keyboard (making it a little difficult to type quickly without errors) and the lack of PCMCIA compatibility. It is also not DOS-compatible, so you have to rely on Psion or third-party Psion developers for applications. However, Psion provides a number of expansion cards, including a $149 spreadsheet card, and the unit does include two card slots (most palmtops feature only one slot). More on this machine in next month's column.



The HP 95LX is an example of the current crop of DOS-compatible palmtops.

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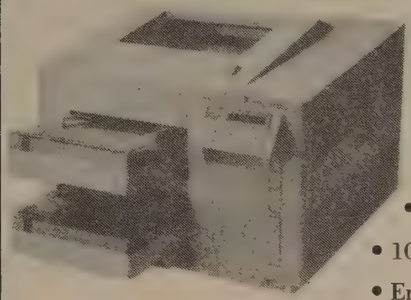

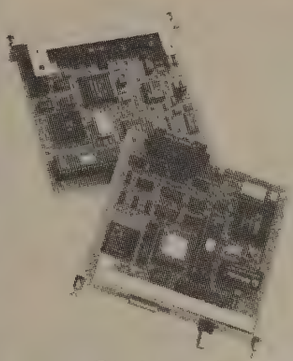

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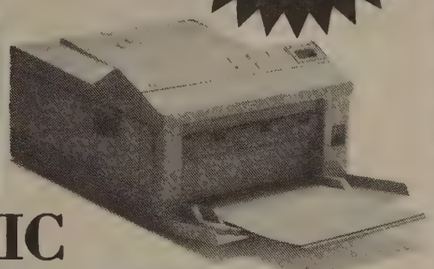

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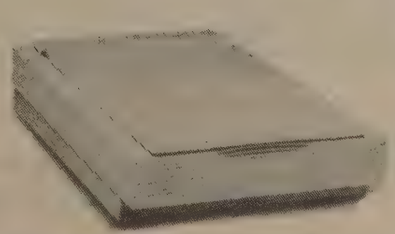

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ever, it does not run DOS programs unmodified (this is actually both a negative and a positive point for the Psion—it lets the Psion have a true multitasking operating system and a very nice user interface combined in a very compact unit). However, many of these higher-end palmtops run DOS, and this means you can download any of your favorite DOS programs to them and run them on the top of your hand.

Not all of these machines feature full-sized screens; a drawback to the full-sized screens, however, is that they add considerably to the computer's size (some call these sub-subnotebooks rather than palmtops.) Many popular DOS programs have been converted to accommodate palmtop screen sizes (such as HP's), but if the program has not been converted, you can still use most DOS applications by scrolling around over the full display.

A very popular new entry into this market is HP's DOS-compatible 95LX, which retails for $699. This sturdy little unit runs DOS 3.22 and includes 512K RAM standard, a 10x40 character screen, a Qwerty keyboard plus numeric keypad, a built-in three-wire RS-232 port, a single PCMCIA card slot, and built-in DOS, Lotus 1-2-3 Release 2.2, financial calculator, communications program, and the usual set of organizer functions. Negative points include a rather blocky, calculator-like appearance; also, the organizer functions are not as easy to use as those in the dedicated electronic organizer line. However, overall, an excellent, powerful unit.

Atari's $300 Portfolio has been on the market for some time. It has an 8x40 character display, 128K of RAM, one card slot, an interface port for connecting to a PC or a Mac, and a number of built-in organizer functions including a Lotus-compatible spreadsheet.

Sharp's PC-3000 will retail for approximately $1000, and has already been available in Asia for some time now. It includes a full 25x80 character screen, two PCMCIA 1.0 card slots, an external disk port, a megabyte of RAM, a megabyte of ROM, MS-DOS 3.3, a Lotus-compatible spreadsheet, and a variety of organizer functions. I will be covering this machine in detail in a future column.

Memorex has also announced its Commuter Computer, a similar machine for $600 retail with 640K RAM, 640K ROM, DR DOS 5.0, one PCMCIA 1.0 slot, an external disk port, and again a full 25x80 character screen. It also has the usual organizer programs and a built-in Lotus-compatible spreadsheet. This unit suffers from a low 8-hour battery life (with four AA batteries).

The Poqet PC, like the Portfolio, has been on the market for a while; it once sold for $1495 list but due to severe competition from the Sharp Wizard and other palmtops can now be found selling for as little as $780. This machine has 640K of RAM, a full 25x80 character screen, and two PCMCIA 1.0 card slots. The unit has a number of built-in organizer functions (somewhat less easy to use than those of its competitors), and offers no Lotus-level spreadsheet built in, so it is a bit behind the times in the software area. More on this unit in a future column as well.

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486DX-33MHz motherboard 256K	$560
IDE CONTROLLER	$20
SVGA card (800 X 600)	$30
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SVGA non-interlace low emission monitor	Call

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PRODUCT WATCH

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ASCO Corporation announces full featured, low cost notebook that eliminates the external power brick.

New laptop PC will feature 386SXL 25 MHz processor, 4 hour battery life, and is the only notebook available with a built in power brick. All this for under $1500, Dealers should take a look at this one.

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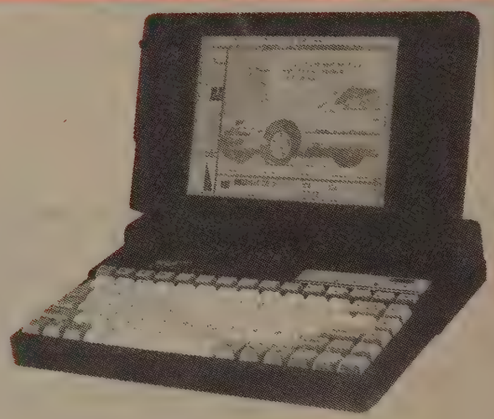

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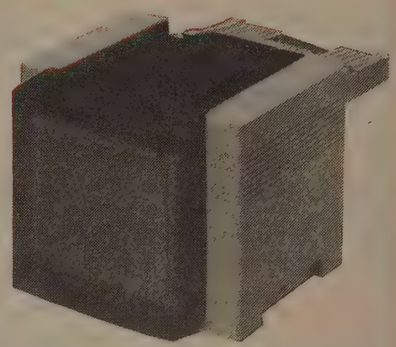

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announced shipments of a PCMCIA-compliant palmtop memory card called the DoubleCard, which employs Stacker-like compression technology to double the amount of space available on a RAM card. Suggested retail prices for the cards are $319 for 1MB, $499 for 2MB, $799 for 3MB, and $999 for 4MB. This compares with, for example, $600 for the HP 1MB PCMCIA RAM card, or the $780 2MB Sparcom PCMCIA memory card.

As discussed above, Intel also recently announced its new $700 20MB Flash RAM cards. A particularly interesting aspect of the card is that its 100,000 read/write cycle limit is ten times the read/write cycle limit guaranteed by other flash memory manufacturers. According to Dick Pashley, general manager of Intel's Memory Components Division, this product is dropping the price of Flash RAM to a level that was not predicted by most experts for at least a few more years.

Meanwhile, Microsoft announced its new Flash File System which will support both the new Intel 20MB card, and those of many other manufacturers. This is a file storage format and device driver intended to allow palmtop computers with Flash RAM cards installed to use them as simulated (very fast) hard disks. The format is not DOS-specific, although Microsoft provides a Flash File System device driver for DOS-based palmtops that allows developers to write to these devices just as though they were ordinary hard disks. Because the format itself is not DOS-specific, however, this standard will allow machines that use different operating systems to read and write to a uniform Flash RAM file format, allowing disparate machines to exchange data simply by exchanging PCMCIA memory cards.

Apple launched its new Personal Digital Assistants, or PDA line of palmtop computers, with the announcement of the Newton palmtop PC. The Newton combines handheld size with a low-power-consumption, high-speed RISC processor that gives it twice the computing power of a Mac IIfx. Apple has not yet announced pricing for the machine, which was shown in prototype at this June's Consumer Electronics Show in Chicago.

The Newton combines an advanced multitasking operating system called NewtOS with sophisticated handwriting recognition technology (the Newton actually employs more than one recognition algorithm simultaneously, to get the best results), and an advanced user interface manager called the Intelligent Assistant, which greatly simplifies operation of the machine. The Newton includes a single proprietary 32-bit slot, which is also downward compatible with PCMCIA 2.0 cards (meaning you can use both PCMCIA 2.0 cards and 32-bit high-speed Apple cards). Future columns will give an in-depth look at the Newton's technology and features.

Also announced at CES was Motorola's support of the Apple Newton with a service that would provide one-way data transfer to devices such as the Apple Newton. The receiver would allow users to receive information such as email, news, weather, sports, and possibly even traffic and airline schedules, wherever they happen to be. This information could be sent to the portable computers via the existing national and local paging common carrier data services.

Next month: a review of the Psion Series 3, an overview of the world of pen-based computers, more about the Apple Newton, and other palmtop and pen news and trivia. ■

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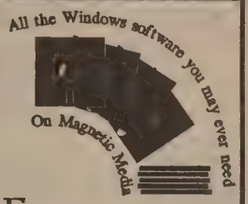

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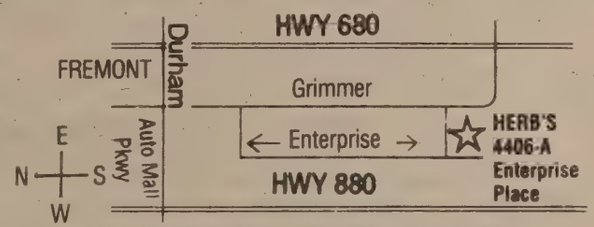

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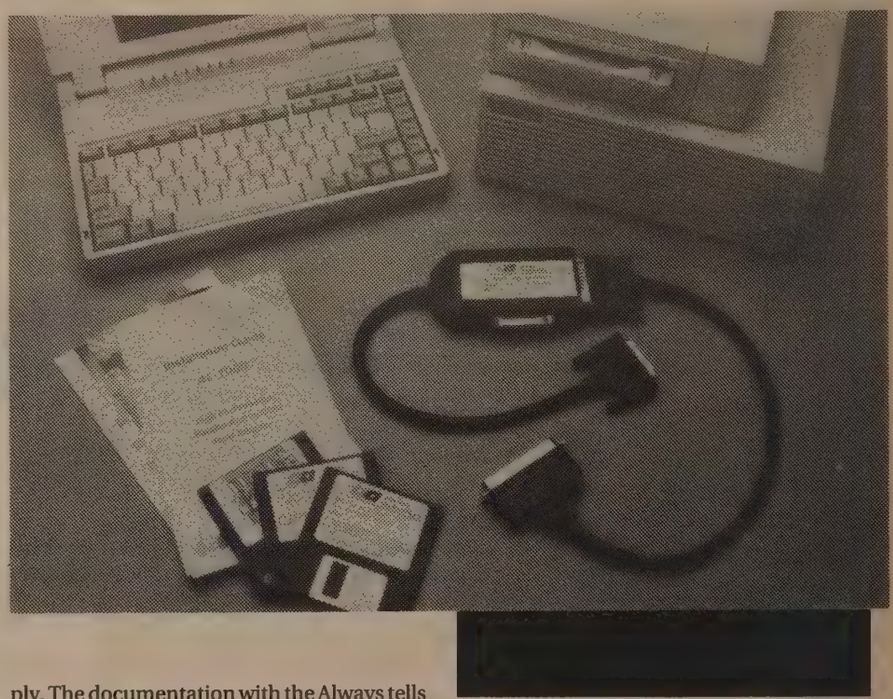
The SCSI Connection

Whether You Use A Desktop Or Notebook Computer, There Are Many Reasons To Use The New AL-1000 SCSI Connector

BY ED KAHN

RESOURCES:

Always AL-1000, $199
Always Technology, Inc.
31336 Via Colinas,
Ste 101
Westlake Village, CA
91362
(818)597-1400



Color displays, huge hard disks, and long-lasting batteries have all played a part in making portable computers the primary, if not only, computer a user needs. But the problems of expandability and connecting peripheral devices continue to plague users.

Since the introduction of the first portables, of a variety of devices has been developed to allow access to drives, tape backups, and other peripherals through the parallel port on the portable. The most versatile solution, however, is the SCSI (Small Computer System Interface) adapter. The Mac world has long been standardized through SCSI connectors, while the PC side of the aisle has not embraced the standardization that SCSI promises with such enthusiasm.

Recently I saw an announcement for a new, high-performance parallel-to-SCSI host adapter. I checked out this product from Always Technology and have some interesting things to report. Making SCSI adapters for PCs—an interface card that accepts a SCSI device—is not new for Always Technology. Unfortunately, comparable access to SCSI devices has, for the most part, not been available for laptop and notebook users. Always has introduced a new product, the AL-1000, that offers the same access for portable computers with a parallel port but lacking an expansion slot.

This device is simple and straightforward to use: You plug the SCSI adapter into the parallel port. This gives you a parallel port for the printer and SCSI port with a connecting cable. The AL-1000 allows the user of portable equipment to access up to seven different devices through a single parallel port and still use a printer.

There have been parallel-to-SCSI connectors before, but Always claims its device is faster and more versatile. SCSI connectors usually require a power source. Generally, this is provided by the first SCSI device you connect. Many of these devices, however, do not provide power to run the connector. The Always connector can get its power from the first device or, unlike the competition, from an external power supply. If your device does not provide power, you can buy a power supply. The documentation with the Always tells how to order this. There is a good chance you will not need an external power source, but if you do, be prepared to spend another $25 or so. Unfortunately, in the interest of keeping the price as low as possible, a power supply is not included.

Whether you use a desktop or notebook computer you can find many reasons to use the Always Technology AL-1000. For instance, an office might choose to have someone perform regular backups using a portable tape drive. This is significantly less expensive than installing tape backups on each computer.

In the near future, I suspect that SCSI connections will become increasingly important to PC users. This will make it possible to take advantage of the many new peripherals as they come to market.

Initially I had trouble installing the AL-1000. The problem was in the documentation and one of the software files, but not the hardware. Always was as helpful as anyone could hope, and I have no doubt that the documentation and rough edges will all be worked out before you read this.

While I was impressed with the product, it seems to me that this is more a prototype than a finished product. For instance, in the course of working out my problems, the company told me that a new model with an LED to indicate whether you need a separate power supply or not will be introduced soon. It will also indicate when data is being passed through the device.

One person at Always Technology told me that a small company like this has to weigh getting all of the rough edges worked out against bringing the product to market as soon as possible. Always opted for getting the product out the door as soon as possible.

Personally, I am glad for this decision because there is nothing about technology that is ever completely worked out. As long as the company is so willing to spend the time necessary to solve users' problems over the phone, I have no problems with this product being shipped. And I am certain that future releases of the AL-1000 will incorporate the changes that the feedback from this early release will bring.

In addition to the hardware, the AL-1000 includes extensive software that is easy to install. The software accommodates almost any SCSI product you need to connect. The product comes in a well-designed package and includes a two-year warranty. ■

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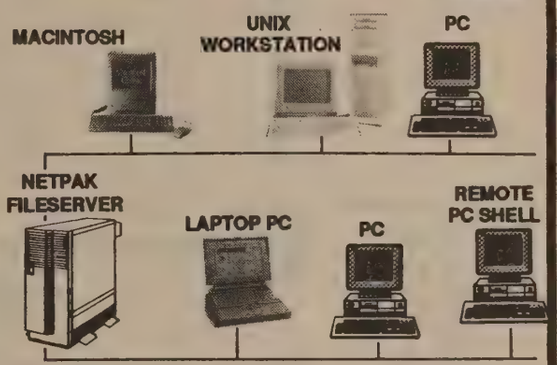

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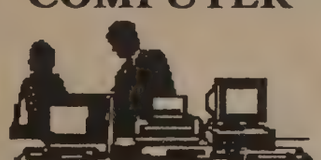

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Computer of the Month:

ALTIMA 433

If you need a lightweight 486 machine, this certainly should be one of the first to examine.

RESOURCES:
Altima 433, $3999
Altima Systems, Inc.
1390 Willow Pass Rd.,
Ste 1050
Concord, CA 94520
1-800-356-9990

During the few years that Altima has been in business, I have come to regard their computers as among the best. Their new 486 models are no disappointment. The entry model runs at 20MHz and carries a price of $2999. The model I reviewed is the 33MHz unit, with a 120MB hard disk and a list price of $3999. Although the prices are high, they include lots of features.

The computer comes standard with 4MB of RAM, expandable to either 8MB or 20MB. The expansion card to bring the system up to 8MB costs $449, but the 16MB card is not yet available and no price has been announced.

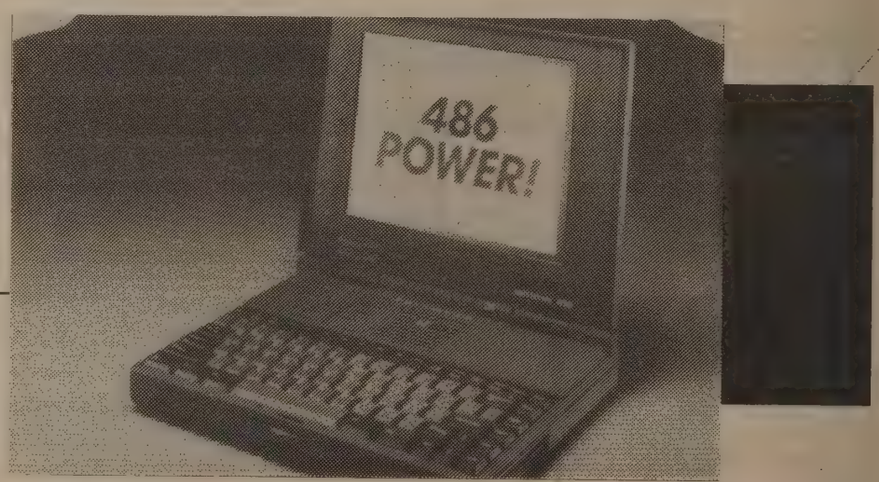
The unit weighs only 5.7lbs. including the rechargeable battery, which will power the system for between two and three hours. A standby switch that shuts down the system, but keeps everything in memory, extends the life of a battery charge even longer. Additional battery packs are available for $129.

The features of the Altima 433 are what set this notebook computer apart from its competition. The backlit 10" VGA LCD display provides an exceptionally clear black on white display. The included utilities give you the option of changing the cursor into a large block rather than the elusive blinking dash.

One of the unique features of this machine is the ability to display on both the LCD and an attached color monitor at the same time. This is especially useful for presentations when you want to see what you are showing without getting in the way of an assembled group. Also, when you connect an external VGA monitor, the resolution can jump to 800 x 600.

I have finally come to realize that I just don't like the feel of notebook computer keyboards because of the short travel distance. Nevertheless, this keyboard has a wonderful layout; I can actually work on it if I don't have a full-size OS/2 keyboard handy. Notebook computers always have an embedded numeric keypad, but at last there is a notebook with separate keys for Home, PgUp, PgDn, and End. This makes word processing tolerable. If you are doing lots of number crunching, you can add an external numeric keypad ($129). You can also get an adapter that will let you run a keypad, keyboard, and mouse. My preference is to get the optional PS2 trackball ($129). This unit fits inside the computer and is better than the clip-on trackballs. For portable computing that requires a mouse or other pointing device, I highly recommend Altima's trackball.

Altima provides only one serial port, but this is actually enough if you use the trackball and buy one of the internal modem devices offered. The best choice is a 2400 baud modem with 9600 baud fax send/receive capabilities ($299).



A 3.5" 1.44MB floppy drive is included, but an optional 5.25" floppy drive ($299) is also available. This connects through the parallel port. If you want a more elaborate setup, you can get the expansion chassis ($599) which will let you operate pretty much as a desktop computer. A carrying case ($29) is available.

Altima provides a one-year warranty. If you need a lightweight 486 machine, this certainly should be one of the first to examine. ■

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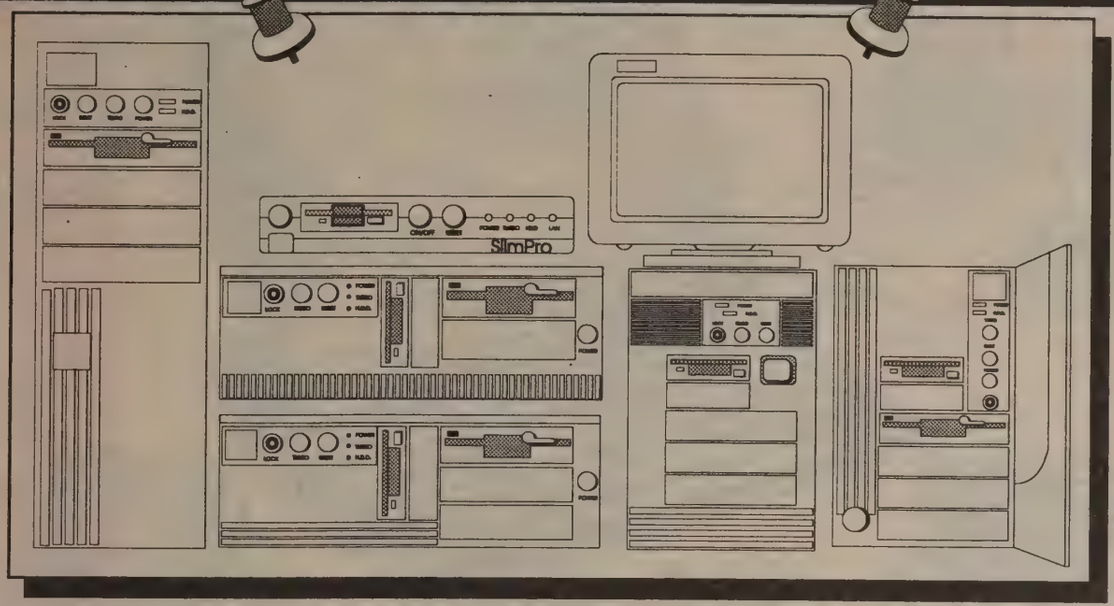

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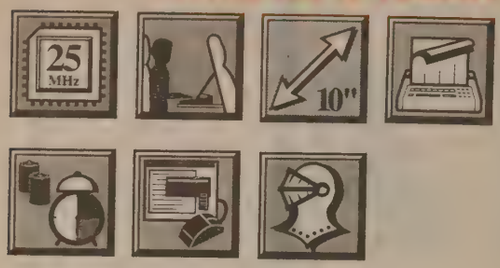

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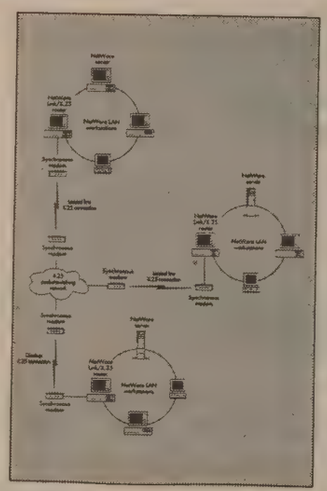

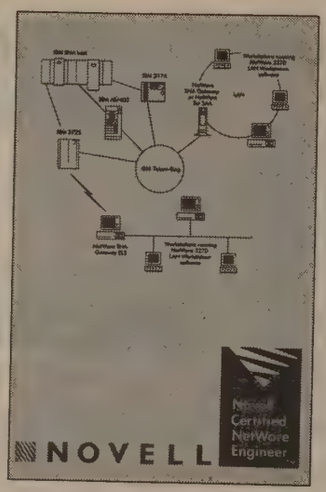

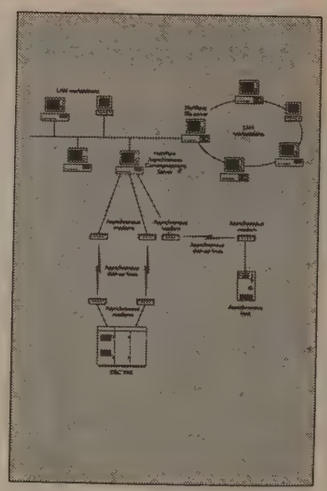

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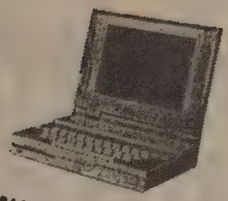

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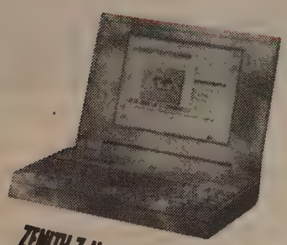

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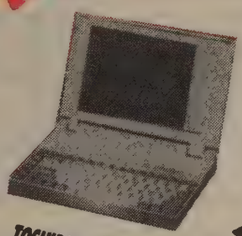

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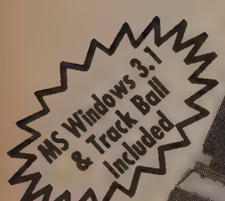

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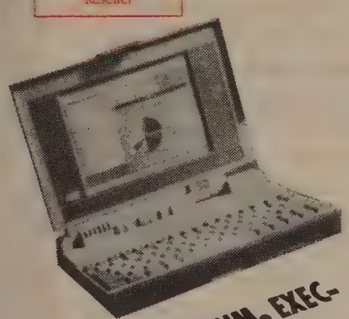

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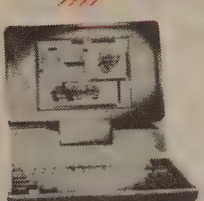

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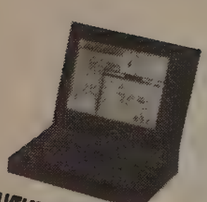

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Wireless Microwave Links Offer Advantages In Building-To-Building Computer Network Connectivity

BY ROBERT MOSKOWITZ

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The University of California, Berkeley, favors them becausthey're much easier to install and more resistant to earthquakes than fiber optics. McClellan Air Force Base, Sacramento, uses them because they're more practical than fiber for crossing heavy-traffic runways and more powerful than copper lines for connecting voice and data with facilities across town. Image-conscious downtown Palo Alto likes them because they're far less visible than wires criss-crossing the rooftops, and less expensive, too.

Yes, wireless microwave links for computer networks (and other applications) have come of age, and they're filling an important niche in the spectrum of building-to-building connectivity options. In calculating the full life-cycle cost of a network link, today's sophisticated users are learning to look past the raw cost of installation and maintenance contracts to the opportunity cost of temporary outages and of limited bandwidth associated with other technologies. Under this arithmetic, the robust, reliable microwave links will frequently pencil out to be the most cost-effective technology for particular installations, even though a typical link can cost $35,000 to $40,000, installed, plus $2000 per year for a maintenance contract.

MICROWAVE OFFERS AN ALTERNATIVE

It wasn't always this way, of course. Until the mid-1980s, microwave links capable of connecting physically separate computer networks were not practical offerings in the general-purpose network market. They were chosen mainly by government agencies, common carriers, and utility companies—organizations with staff engineers able to design, install, test, license, and maintain these radio-based information pipelines. But during the 1980s equipment costs came down and the effective bandwidth increased until microwave vendors, led by David Theodore of Microwave Bypass, Inc., began selling directly to end-user organizations that needed a turnkey solution for interconnecting separate networks. That strategy sparked a revolution in microwave networking.

"The key to the viability of microwave for ordinary end-user organizations," says David Theodore, founder of Microwave Bypass, which has about 80% of the market for microwave network links, "is that vendors now provide the technical expertise and end-user service that most customers expect. Hardly anyone has the in-house expertise to run their own microwave links. So we do it for them. We keep the systems up and running so people continue to believe in microwave. In fact, people often call me at home, knowing I'll take care of their problems. If a microwave link should go down, within four hours we have a guy on the customer's rooftop getting the system back up and running."

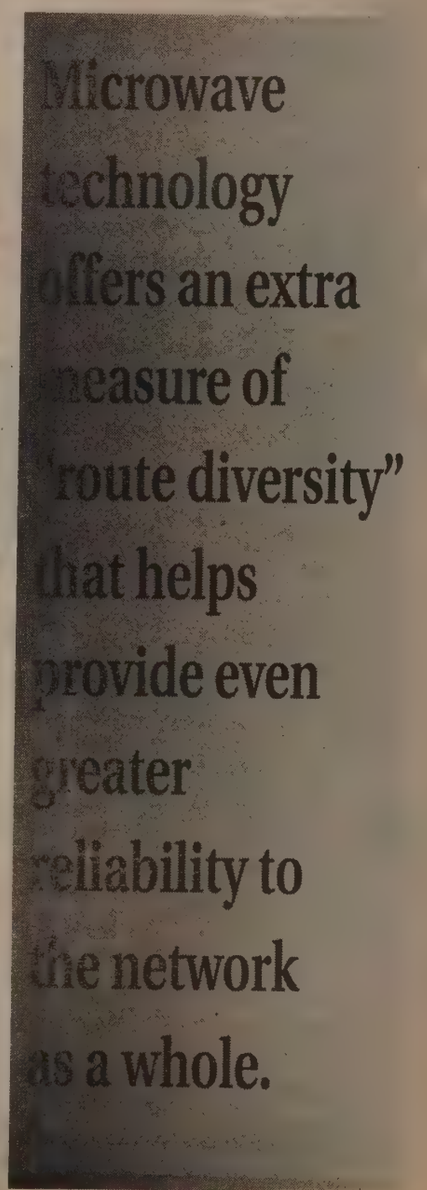
Today's vendors provide all the start-up and maintenance services required for microwave links to be feasible—they make the process as simple for their customers as ordering a network line from the local telephone company. For example, today it's the vendor, not the end-user, that handles the FCC paperwork necessary to secure a license for the microwave radio frequencies which will carry the network communications.

This service-oriented, turnkey strategy has helped networking via microwave mature into a viable, practical mid-range alternative. Microwave links suit a broad range of organizations for whom easy-to-set-up leased lines offer too little bandwidth, and for whom fiber optic lines offer plenty of bandwidth but are prohibitively expensive or physically impossible to install.

Microwave is finding acceptance not only in the California and US markets, but worldwide. In Mexico, for example, fiber is not yet an option and telephone lines are simply inadequate for most data communications requirements. In Canada, the government has deregulated Bell Canada rates, allowing prices to rise much too high for leased lines and associated equipment to be cost-effective. North of the US border today, a microwave network link often pays for itself in the first two months of service!

RELIABLE CONNECTIONS

For years, many people have assumed that microwave connections are subject to fade-out or loss of signal from ordinary atmospheric conditions. In fact, microwave is much more reliable for data transmission than even the Bell Telephone specification for leased lines. That standard, 99.85% uptime, allows for nearly fourteen hours of outage per year. Typically, microwave links are down far less than this amount, and many—particularly in areas like California where good weather prevails—operate for years with no downtime whatsoever. If reliability is mission critical, one microwave link can provide



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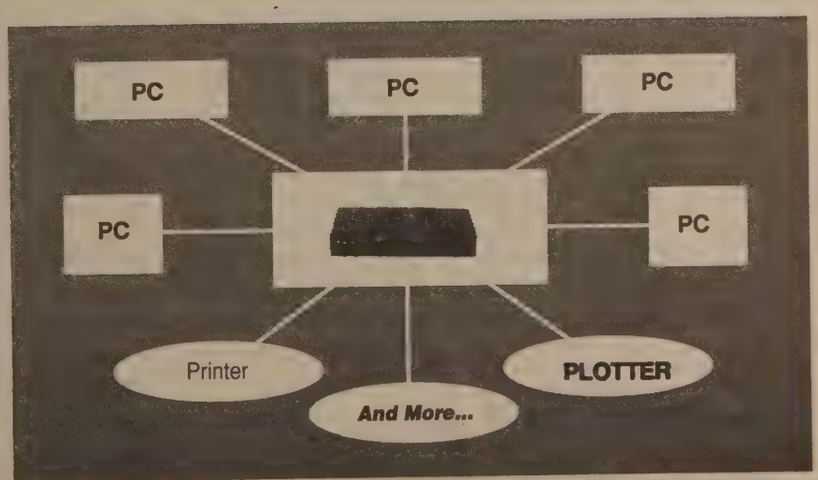

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backup for another, or can itself be backed up by leased lines or fiber connections. (Properly designed networks usually have the potential to reroute messages along alternate pathways already in service when any part of the primary path goes down.)

In addition to their inherent reliability, microwave technology offers an extra measure of "route diversity" that helps provide even greater reliability to the network as a whole. This was vividly demonstrated during the recent basement floods in Chicago, where virtually all leased lines—both primaries and backups—went out of service as the water flooded in. Microwave links installed on the roofs of buildings were not knocked out by the water.

There are limitations to microwave networking, however. One of the most important is a maximum range of about ten miles because of ethernet timing requirements. This is about double the distance limit of just a few years ago, an improvement that was obtained by avoiding collision problems with true duplex ethernet bridges that keep the send and receive paths entirely separate from one end of the link to the other. Thus, instead of a microwave link using one frequency, it uses two (as fiber uses two cables instead of one), constantly sending from one unit and receiving through another unit at both ends of the link.

INSTALLATIONS AND OPERATION

The installation cycle includes a site survey, selecting appropriate radio frequencies and applying for a license, fabricating antenna mounts, tuning and bench testing radios with the requisite network gear, and installing and testing the link.

The microwave radios broadcast through carefully aimed, focusing antennas ranging from 1 foot to 6 feet in diameter. With miniaturization, the rooftop package for a 10-mile microwave link can weigh as little as 15lbs. However, high-frequency microwave signals cannot pass through buildings, trees, rocks, or earth. This means microwave requires a clear line of sight from one antenna to the other, creating difficulties in crowded urban areas, where a tall building can intervene, and in mountainous regions, where hills and valleys can prevent direct line-of-sight communications between two fixed points. But the difficulties are usually resolved quite simply.

Cadence Design Systems, a software engineering firm in San Jose, CA, solved a line-of-sight problem between two of its buildings by installing a repeater station on top of a third building with a clear line of sight to the other two. Automated and completely independent, such repeaters can be located on hilltops, on the roofs of office towers, and at the range limit of otherwise clear line-of-sight links. If it's not practical to locate a repeater somewhere along the route, towers at one or both ends of the link can solve a great many line-of-sight problems.

One requirement for reliability is a rigid mounting structure for the antennas. Top-quality vendors try to provide survivability in a 100mph wind. In California, earthquakes can move an antenna slightly out of alignment. But minor alignment problems won't cancel the signal. If an antenna shifts, there is generally enough overlap at the receiving end that users generally don't notice any degradation in network performance, and a technician can easily re-aim the dishes without disrupting network communications.

The microwave radios operate in the 18GHz range and more popularly in the 23GHz range, which the FCC calls the K-band. At present, the K-band provides twenty-two frequency pairs—one for the sending unit and one for the receiving unit at each end of a microwave link. But in practice, there is no limit to the number of connections possible because each link uses a very directional beam, tightly focused to less than about 8 feet across at the widest point. Thus, even in the most crowded areas organizations can install separate microwave links using the same frequency pairs—if necessary—just by setting the beams emanating from the same antenna point at slight angles to one another, or by placing antennas for the two microwave links 40 or 50 feet apart.

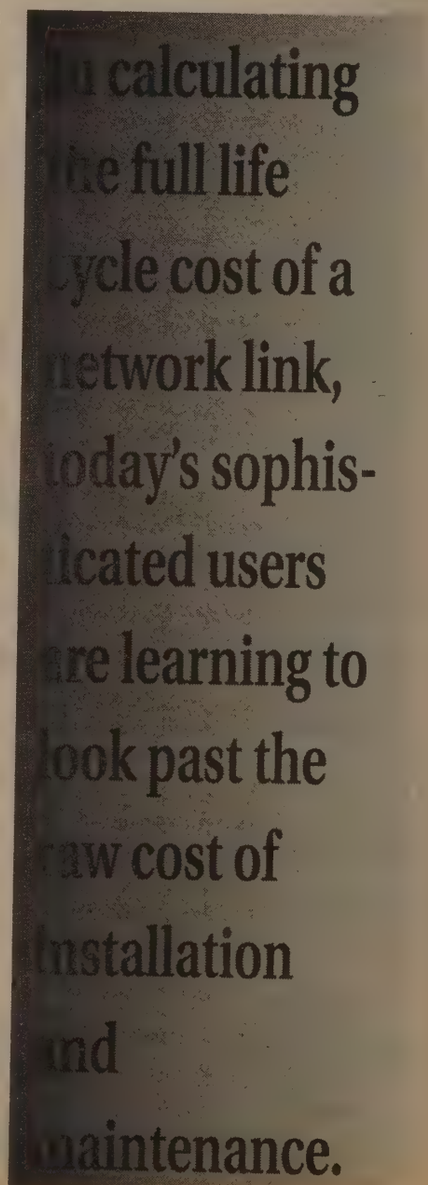
The radios operate at very low power. The microwave in your kitchen typically puts out about 650 watts of power. The microwave radio carrying the network signal from rooftop to rooftop operates at 65 milliwatts—about one ten-thousandth as much energy. This energy level is well under established safety standards, and virtually undetectable except at the receiving end of the focused beam.

Despite the low power output, signal reliability is entirely unaffected by hail, snow, smog, wind, heat rising from the pavement, and so forth. The only weather that interferes with microwave is severe rain. The raindrops reflect and scatter the signal, and when there are enough raindrops in the air, network performance across the microwave link can be compromised or cut off.

Electronically, the microwave link behaves just like a standard network interface that connects to any bridge, repeater, or router installed on the network. The microwave link is delivered with all the necessary network-to-microwave conversion devices. This allows the microwave system to be completely transparent to the network, and fully functional. The microwave link supports packet filtering, protocol routing, SNMP, spanning tree, and other necessary network features. More than 80% of microwave link installations are intended to provide ethernet continuity, but support for other network types, including token-ring and voice transmissions, is readily available.

WORKING WITH MICROWAVE LINKS

The ease of installing microwave network links is illustrated by the experience of Silicon Graphics, the Mountain View, CA, maker of



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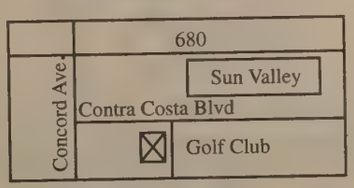

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high-performance workstations. When they recently acquired MIPS Computers, they outgrew their present campus and needed to expand. However, the new site was located across a creek from their present facility. The company signed a lease on the building at noon on a Friday, and their new microwave network link to the new building was operating by Wednesday of the following week. Within two weeks Silicon Graphics installed four new microwave links, operating "experimentally" until the FCC licenses came through. With two antennas per building, the system provides a great deal of reliability and also lets the company isolate various networks from each other.

At Mare Island Naval Reservation, near Vallejo, CA, seven different microwave links tie widely dispersed government facilities into a single network. Microwave was selected not only because of its relatively low cost, but because of the flexibility it offers. As organizations and work groups shift from one far-flung building to another, it's far simpler to relocate the appropriate antennas than to lay new cable.

At McClellan Air Force Base, Sacramento, CA, the cost of connecting orphan buildings by routing fiber optic around and under active runways was estimated at $100 to $150 per foot! Microwave was a far more cost-effective alternative. Microwave was also the best choice for linking the base to the hospital which will remain open when Mather Air Force Base, 7 miles across town, is shut down. With two sending units and two receiving units at each end, this microwave link supports two ethernets and eight T1 telephone lines.

At Edwards Air Force Base, a couple of dozen microwave links are being installed to support ethernet networks, as well as video and voice. According to Tully Becker, some of the microwave links connect a central command facility with rocket motor experiment and test areas about 4.5 miles away.

"We had a problem with fiber," says Becker,

continued on page 260

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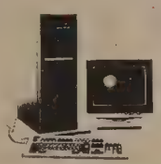

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- Viewsonic 4E Super VGA Monitor (1024x768 w/.28 Dot Pitch)
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- Teac 1.2 MB 5.25" Floppy Drive
- 2 Serial, 1 Parallel, 1 Game port, I/O Card
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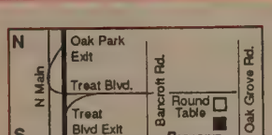
Citizen GSX 145 Wide Carriage	415



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Groups, Classes, And Hidden (Fax) Magic

Demystifying One Of The Black Boxes Of Communications Technology That Has Been Integrated Into Our Everyday Work Environment

BY PETER JOHN HARRISON

Modern communications technology often seems like a black box: someone types something in here, and it prints out over there. Some users are better than others, but, with few exceptions, fax technology is the blackest box of all. Very few people have any idea how a fax machine works; put a letter in here, a number in there, and *poof!* It comes out over there!

Fax technology has become a business necessity, with thousands of businesses depending on their fax machines to help them remain competitive. Yet, even the people in charge of buying equipment for their business or company may know little more than to look for a "Group Three" machine (whatever that is). Now, computer modem manufacturers are making data/fax modems that combine the functionality of a data modem with most of the functionality of a fax machine, which is great... Except no one knows what a fax machine does in the first place.

1-2-3 GROUP FAX

Fax—a term that is actually a contraction of "Facsimile Transmission"—has been with us since World War II. The principle of operation for these early machines was simple: the page to be sent was mounted on a cylinder and spun around under an optical reader. Each time the reader saw black, it sent a noise down the phone line. The longer it saw black, the longer it made noise, and the blacker the mark, the louder the noise it made.

At the receiving end, another blank piece of paper wrapped around a spinning cylinder was darkened by an electrode that burned a dark spot in the paper each time it heard noise on the line. In this way, stripes of the document image would be transferred down the phone line as the optical reader and the receiver electrode spiraled their way down the page.

The quality was horrible. Static on the phone line caused dark spots to get burned here and there on the receiving page, and occasionally the drums would get out of sync, resulting in completely unreadable faxes. Even when everything worked perfectly, "Group One" fax (the name later assigned to the technology by the CCITT) was slow, taking six minutes to transmit a single page.

Group Two fax, introduced in the late '70s, made several improvements over the older Group One standard. Foremost were three changes in the way document images were transmitted. Group Two fax images were converted into a digital format and sent using a modem, which are less affected by line noise than the analog signal employed by Group One. Group Two fax also used a mathematical formula to compress the binary image, which shortened transmission times to three minutes per page. The final major enhancement was the incorporation of a flat-bed digital scanner that could be fed one page, then another, making it possible to send multipage faxes.

Group Two fax was a revolutionary improvement over the older standard, but the machines were expensive, and still took three minutes to send each page. Group Three fax machines did not revolutionize the way faxes were sent, but made important improvements to the technologies used by Group Two.

Group Three fax, like Group Two, converts document images into a binary form, but has both standard and fine scanning resolutions of 100 x 100 dots per inch (dpi) and 100 x 200 dpi. Also like Group Two, Group Three images are compressed and sent by modem, but the compression algorithm is much more efficient and the modems much faster.

Group Three fax machines entered the marketplace in the early '80s, a time when electronic office technologies were beginning to catch on. Throughout the '80s, businesses were busy buying everything from desktop computers to cellular telephones to help them gain or keep their competitive edge. Group Three fax rode the wave to a beachhead of companies and individuals ready to put fax technology to work. Soon, people started adding their fax numbers to letterhead and business cards, and "fax" became so popular that the US Postal Service responded by installing fax machines in many of their post office lobbies.

EVOLVING TECHNOLOGY

While all this was happening, fax technology continued to evolve. The Group Three standard specifies how document images will be formatted and compressed (for those interested in technical details, these requirements are laid out in CCITT recommendation T.4), how two fax machines will "negotiate" with one another to exchange information about whom they are and how they operate (CCITT T.30), and the overall flow of a fax call. Other details, like what modem modulation technique is used to send and receive fax data and how the document is converted into a digital image are only loosely defined, left so that the technology could continue to improve.

Modern fax machines actually have to support several different modem standards—up to four different modulation methods, supporting seven different transmission speeds, from 300bps all the way to 14,400bps. (For the technically inclined, V.21 at 300bps, V.27ter at 2400/4800bps, V.29 at 4800/7200/9600bps, and the newest standard, V.17 at 4800/7200/9600/12,000/14,400bps.)

To sort out what modem transmission technique can be used to send the fax image, Group Three machines open each phone call with a "handshaking" and "negotiation" procedure (T.30). The negotiation procedure starts the call off by exchanging information (at 300bps) about each machine, like whom the machine belongs to, what their phone numbers are, and so on. Once the two fax machines have introduced themselves, the calling unit sends a burst of test data at its highest speed. If the receiving unit can understand the burst, it sends an "acknowledg-

Copyright © 1992 by Peter Harrison. All rights reserved. *Peter Harrison, a San Francisco-based data communications and connectivity specialist, can be reached via Usenet (peterh@well.sf.ca.us) or CompuServe (74017,1716).*

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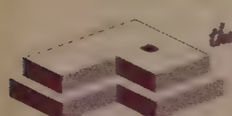

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ment" (at 300bps), and the sending unit starts transmitting the fax images it has to send. If the receiving unit doesn't understand the burst of test data, it sends a "negative acknowledgment" to tell the sending unit to try its next lower speed, and the process repeats until the receiving unit acknowledges the test burst.

THE HIDDEN DATA/FAX MODEM

So far, I've been talking about Group Three "fax machines," but the Group Three specification doesn't require your fax equipment to be a machine with an integral scanner and printer.

Data/fax modems offer advantages over traditional fax machines. They are much less expensive, take up less desk space, and send crystal-clear faxes.

Data/fax modems offer several advantages over traditional fax machines. They are much less expensive, take up less desk space (or no desk space, if the data/fax modem is an internal card), and send crystal-clear faxes that don't suffer the inevitable degradation that occurs when a document image is translated into a digital format by a scanner. Faxes received by a data/fax modem can also be printed on plain paper using a laser printer—not that waxy, curly stuff usually associated with a fax machine. (If you prefer, you can use a non-laser printer, but even fast dot-matrix and ink-jet printers take two minutes or longer to print a fax.)

Choosing a data/fax modem, however, is even more complicated than selecting a regular fax machine. There are many types of data/fax modems, from 4800bps send only units to internal modems that not only employ the recently approved 14,400bps V.17 modem standards, but have their own CPU and memory. So, while all Group Three data/fax modems can transmit and most of them can receive images from any Group Three fax device, the cheapest Group Three data/fax modem may not do all you need it to, and the most expensive may have capabilities you'll never need.

EIA CLASS BEGINS

Remember all that mumbo-jumbo about answering the fax call at 300 bps, then "negotiating" to find the fastest mutually available modem speed? Different data/fax modems handle this negotiation process differently.

EIA Class One data/fax modems expect the computer's CPU and software to do all the footwork, telling the data/fax modem what modulation standard to use at what speed, when to switch from one speed to another, and to assemble and interpret the test patterns. Having the CPU do this is O.K., but it makes the application program that drives the fax process more complicated, and it means the CPU has to be more attentive to the fax modem's needs—which slows down any other things you're doing. Some TSR hot key programs can adversely affect Class One data/fax modems, too, by stealing a slice of CPU time at the wrong moment, causing failed or lower speed connections.

EIA Class Two data/fax modems handle the negotiation process internally. Class Two modems assure that fax calls will always proceed at the fastest possible modem speed, make it easier to write fax

Continued

Getting The (Fax Modem) Job Done

For the last few months I've set aside my 9600bps (bits per second) modems at work and home in favor of some newer, faster data/fax modems from Practical Peripherals, Computer Peripherals, and Intel.

All three support the 14,400bps V.32bis standard for data transmission and the V.42bis standard for data compression that can boost throughput to as much as 57,600bps when transferring uncompressed data files. As data modems, they're all solid performers that I'd feel comfortable recommending to anyone who needs a fast modem.

All three modems come with software that supports both data and fax communications. My home system is a PC compatible, so the software that came with my evaluation units are for the PC. Macintosh software is available for the external modems from Practical Peripherals and Computer Peripherals.

Practical Peripheral's PM14400FX SA offers a bank of lights that tells you what it is doing.

All three modems also support Group Three fax and the newest and fastest 14,400bps fax modem standard, V.17. So what's the difference? The Practical Peripherals modem is a Class One fax modem, the Computer Peripherals modem is Class Two, and the Intel modem is an internal card with a coprocessor on it.

The Practical Peripherals PM14400FX SA is a well-designed modem. Along with the usual LEDs that light up as the modem goes online and sends or receives data, there's a little LCD display that tells you, in English, what the modem is doing—what speed the connection is running at, whether data compression is turned on, even how good or bad the phone connection is. I love it! And since Practical Peripherals is owned by Hayes, I feel comfortable saying their modems are truly Hayes compatible.

Computer Peripheral's Viva 14.4/Fax is a pretty modem. Its art deco-look tower comes with a little granite-look stand to hold it up (which gives it a very small desktop footprint). People who equate rugged looks with solid performance will be surprised by the Viva 14.4/Fax, which has performed as well as any data modem I've had, and has done well with my faxes, too.

The cute little status lights were the only part of the Viva 14.4/Fax that bothered me. Where most external modems have LEDs, identified by short two- or three-character abbreviations that describe their function, the Viva 14.4/Fax has little pictures that light up. This is OK...if you're willing to learn what all the little icons mean. I'd much rather

Continued

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In database server test, the **Axik** surpassed Dell, the previous leader, by 5 percent in transactions per minute (TPM). The **AXIK** was 4 percent faster than ALR. In the previous review, we attributed part of Dell's efficiency to its three-bay drive array. The **Axik** excels in this capacity with only one drive.

The **Axik ACE** is a superior high-end file server with an extremely low price.

Info World 2/24/92

intel inside

All Axik Ace Cache 486-50, 486DX2-50, 486DX-33, 486SX-25 Come With The Same High-Quality Features, Performance & Architecture, Backed By 8 Years of Motherboard Design, Manufacturing and System Integration Experience.

APPLICATIONS TESTS — **INFO WORLD**

486/50 PCs

(test times in minutes:seconds)

	AXIK ACE CACHE 486/WB-50	ALR Powerpro 486/50	Compaq (1) Deskpro 486/50L	Dell (1) Powerline 450SE
PRICE	**$4,399**	**$12,889**	**$12,999**	**$12,899**
File server tests				
Office test 24-station	01:57	01:59	01:53	01:52
Database file server(2)	1.70	1.64	0.71	1.61
Workstation tests				
CPU intensive	07:24	06:29	06:23	07:32
Disk intensive	21:36	17:53	15:59	23:48
Multitasking	01:23	01:03	01:02	01:08

1)Compaq Deskpro 486/50L and Dell Powerline 450SE Reviewed January 20, page 97

2) Transaction per minute for 24 stations, with a theoretical maximum of 6.0; higher indicate better performance

Reviewed By PC MAGAZINE *June 16, 1992*

INFO WORLD

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REVIEWED BY PC MAGAZINE **JUNE 16, 1992**

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The 50 MHz 486DX system zips through applications with power and panache. And with the technologically enhanced and expandable motherboard, this system should satisfy your computing needs for years to come."

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"We liked the Axik more and more over time. Axik Computer's $2,899 Ace Cache 486DX2-50 System minitower was a favorite among our lab testers, who loved its chassis design and couldn't get over its outrageously fast hard drive performance."

REVIEWED BY COMPUTER SHOPPER **JULY 1992**

"You Can Have It All with the *Ace 486/50*"

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"From the PC connoisseurs viewpoint the most interesting thing about the Axik is its motherboard. Axik makes its own boards, and the company's attention to detail shows"

"When you put it together, it's hard not to like the Ace Cache. While some buyers may be reluctant to go with a small startup company's computer, in this case, they should not be hesitant. This is a finely crafted machine made with quality parts. With the Ace Cache, you get great power, performance, and price. You really can have it all."

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"A GREAT BARGAIN"

"Axik Computers has gone to the trouble to build its own boards-and its home-grown ACE-motherboard-loaded tower system blows the competition out the door"

"RECORD TIMES"

"That's why we run our RealWorld Benchmark Tests twice on the Axik: we didn't believe the results the first time out. For the most part, the Axik's scores were among the lowest (that is, fastest) we've ever seen."

"Flat-out performance doesn't mean much if you're not getting value in other areas. The Axik 486WB/50 uses high-quality components like TEAC and Quantum drives, an Orchid VGA card, and a well-built roomy tower case. "All things considered the Axik at $2,849 isn't just a good deal: It's a fantastic buy!"

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486-50C EISA	$1359	$1539	$1809	$1959	$1999	$2099	$2169	$2359
486DX2-50C EISA	1209	1389	1659	1809	1849	1949	2019	2109
486-33C EISA	1059	1239	1509	1659	1699	1799	1869	1959
486-50/256K	–	–	Best	Best	Best	Best	Best	Best
486DX2-50/64K	779	959	1229	1379	1419	1519	1589	1779
486-33/64K	559	739	1009	1159	1199	1299	1369	1559
486SX-25/64K	339	519	789	939	979	1039	1109	1339

BASIC SYSTEMS INCLUDE: M/B, CPU, 1 MB RAM, (512KB For 286) 1:1 2 FD/2 HD Controller, I/O (2S/P/G), 1.2 MB or 1.44 MB FD, Math Co-Processor Socket, Case + Power Supply, 101-Key Enhanced Keyboard.

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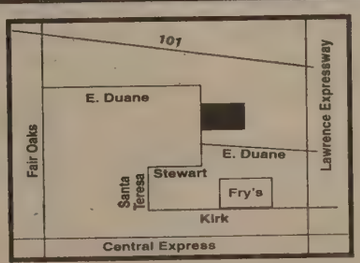

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application programs, and allow other applications running on the CPU to fly along unimpeded by the handshaking and negotiation process. Once the fax image data starts moving, the CPU still has to devote time to the fax process.

Modern fax machines have to support several different modem standards—up to four different modulation methods, supporting seven different transmission speeds, from 300bps all the way to 14,400bps.

With faster data/fax modems, fax image data moves back and forth briskly, and each block (actually data frame) of image data gets passed on to the CPU for processing. Standard Class One and Two modems pass that information by generating a bus interrupt to tell the CPU there's data to deal with. At slower speeds this works fine, but high-speed fax cards can pump data through so quickly that receiving a background fax noticeably slows the program you're working on.

To soften the impact of faxing on other applications, some internal fax boards have their own memory and CPU. These coprocessor boards work like a computer within a computer, handling the most tedious details of the fax process so the main CPU can devote more of its muscle on a foreground process, like a Windows program.

Any of these data/fax modem technologies will get the job done, but if you're planning on doing lots of faxing from your computer, you'd be wise to look for data/fax modems and software that support the Class Two interface. Similarly, if you plan on doing lots of background faxing while working on other applications (particularly CPU-hungry Windows applications), a fax coprocessor board might be your best choice.

A GREAT WAY TO FAX

Data/fax modems, coupled with your computer and the right software, are a great way for small businesses and people with a home office to send and receive faxes. Inbound fax images can be printed, stored on disk, manipulated, even incorporated into other documents and printed or re-faxed. Outbound faxes can be made to incorporate your letterhead, signature...everything you expect to see in a letter, and your faxes make it to your recipient's hands looking as crisp as if they'd been printed and mailed.

Most fax software packages also log fax events on disk, so you can review what and when you've sent and received from whom. It's almost like having a $4000 top-of-the-line plain-paper fax machine, with a few added advantages thrown in to make up for the lack of a document scanner (which, of course, you can buy with the money you save).

Whether you choose a conventional fax machine or a data/fax modem is up to you. Personally, I prefer using a data/fax modem in my home office. It's inexpensive, doesn't take up much room on my desk, and saves me the hassle of having to print something, fax it, then throw the original away. My data/fax modem saves me time, money, and space, and that's important to my business—and yours. ■

RESOURCES:

Viva 14.4/Fax, $499
Computer Peripherals, Inc.
667 Rancho Conejo Blvd.
Newbury Park, CA
1-800-854-7600

PM14400FX SA, $549
Practical Peripherals, Inc.
31245 La Baya Dr.
Westlake Village, CA 91362
(805)497-4774

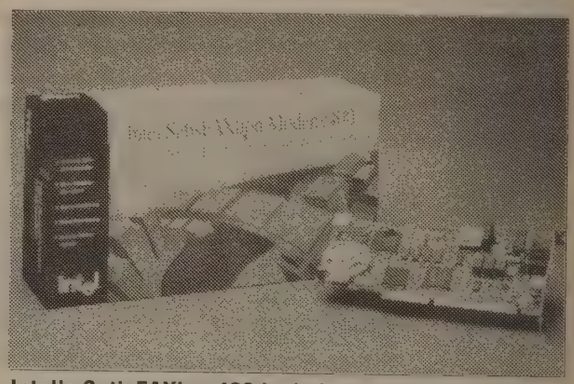
SatisFAXion, $499
Intel PCED
5200 N.E. Elam Young Pkwy.
Hillsboro, OR
97124-6497
1-800-538-3373

Getting The (Fax Modem) Job Done...Continued

stick with the old, boring acronyms I've gotten used to over the years.

Intel's SatisFAXion 400 data/fax modem is available as an external unit or as a PC-compatible internal card. The advantage of Intel's internal modem is that it has an onboard coprocessor to help manage high-speed data and fax communications "in the background" without draining CPU power away from other applications.

Another useful feature of Intel's internal card is intelligent line sharing, an important advantage for people (like me) with only one phone line for voice, data, and fax calls. The SatisFAXion 400 is able to pick up the phone and "listen" to what's at the other end. If it hears beeping, the call is handled as a fax. Complete silence, it assumes a modem is at the other end. And if it hears background noises, it assumes it's a voice call and rings the phone(s) attached to its "phone" connector. The SatisFAXion 400 can also take advantage of "distinctive ringing" services offered by the phone company, or you can handle the routing yourself, by picking up each call and routing data/fax calls to the modem by pressing the pound sign ("#") on your phone.



Intel's SatisFAXion 400 includes a coprocessor to help manage high-speed data and fax communications.

Using these modems at home in my mostly DOS environment, I honestly didn't notice much difference in the hardware's performance. Software was another matter.

The PM14400FX SA and Viva 14.4/Fax both come with QuickLink II from Smith Micro Software to handle data and fax communications from DOS. QuickLink II is easy to use and will do the job, but you'll quickly yearn for software that keeps a better log and sends higher quality faxes.

Intel has its own fax software for DOS, and it's excellent. Not only does it handle translation of HP PCL and Epson print commands to fax format, it allows you to incorporate image files containing letterhead and signatures, so the faxes you send can look exactly like those you send to a printer and sign. For data communications, the SatisFAXion 400 comes with Crosstalk Communicator.

Both the Viva 14.4 and SatisFAXion 400 modems come with Windows software, too. The Viva 14.4/Fax comes with WinFax Lite, from Delrina, which can both send and receive faxes. The SatisFAXion 400 comes with a send-only version of Intel's FAXability program.

My choice of modems? It's hard to say. The SatisFAXion 400's has great DOS software and intelligent line sharing. The Viva 14.4/Fax has a small footprint and comes with good Windows software. The PM14400FX SA has the LCD display that could help me track down a communications problem more quickly.

It's a real toss-up. How did that rhyme go? Eenie Meenie Minie Moe, catch a modem by the...toe?

—Peter John Harrison

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386SX 25MHz	$415	$285	$733	$856	$1,050
386SX 33MHz	$459	$327	$761	$879	$1,089
386DX 25MHz	$475	$345	$785	$885	$1,105
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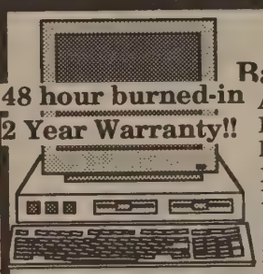

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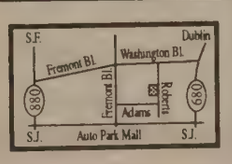

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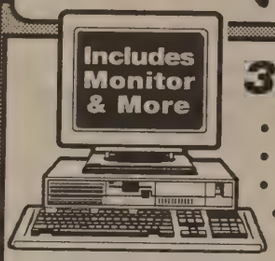

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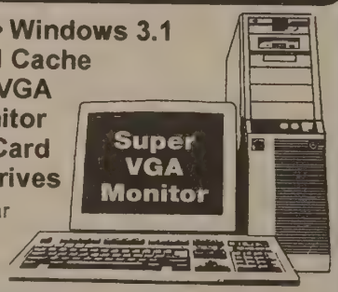

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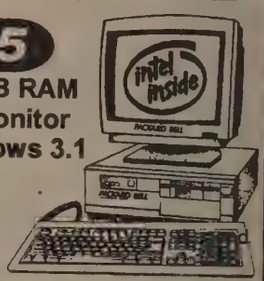

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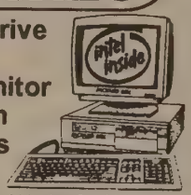

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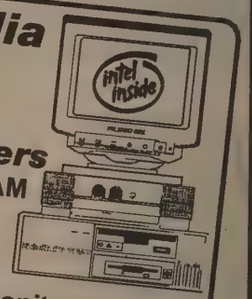

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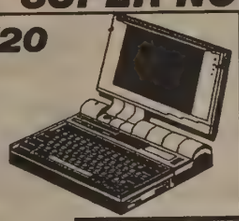

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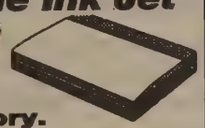

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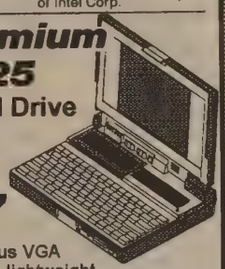

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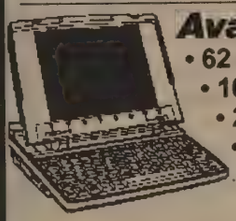

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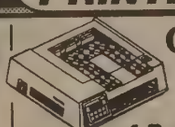

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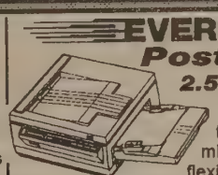

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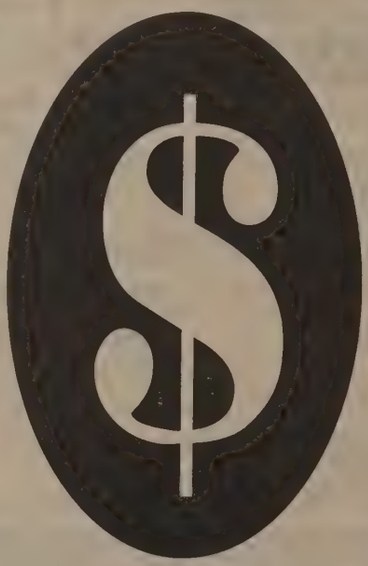
Narrowing The Field For Selecting Accounting Software

Time And Money Can Be Saved By Examining Your Accounting Needs And Opportunities Early Before Purchasing A New System

BY DAVID SIMON, CPA, AND JENNIFER ROBIN CHERNISS

The vast array of accounting products on the market today may offer the newcomer a daunting confrontation of choices. By getting a solid feel of your company's accounting and management goals, it is possible to eliminate many packages and approaches early on in the selection process. The selection of a new computerized accounting system should always be done in conjunction with an in-depth needs analysis, assisted where necessary by a qualified accounting professional. Once you know more precisely what you're looking for, the task is reduced to a matter of comparing available software in a suitable class to find the best combination of features and usability that meets the needs and limitations of your company.

The story of a fictitious client, George Goodigoodi, owner and president of Multinothing, Inc., presents a glimpse of the decision path commonly followed. Multinothing, a retailer and distributor in the gizmo business, has fifteen full-time employees, including commissioned salespeople, a marketing executive, a bookkeeper, as well as warehouse and clerical staff.



GETTING FAMILIAR WITH THE MARKET

Prior to seeking my help in conducting an in-depth needs analysis and accounting software installation for Multinothing, George had started his search for the ideal accounting software much as he had done for his word processing package, years ago. He read reviews, contacted vendors for more information, and spoke to friends to see what they were using. He quickly learned that this search method was more complicated and cumbersome then anticipated, but wasn't sure how to narrow the field to a class of products best suited for the size and complexity of his operations.

George knew that the software should be for a microcomputer environment, possibly a network. He also talked with his bookkeeper about specific features she'd like to have, and had concluded that Multinothing's requirements were probably sufficiently generic to be handled by most packages. The question, he thought, would simply be to determine which offered the greatest ease of use for the best price.

Multinothing's detailed reporting needs and his staff's desire for integrated management information had already led George to rule out the range of software packages costing under $1000, because they failed to offer the wide variety of options and reports available in the fancier packages. For example, George wanted to be able to "what if" different methods of costing inventory, or to automatically reallocate costs from overhead to inventory. He had learned from studying the reviews that a typical high-end package would offer numerous ways to cost inventory, whereas entry-level packages he had read about simply costed all inventory at average purchase price.

Likewise, he seriously considered hiring a custom programmer—a choice which would have taken a long time and eaten up a good-sized budget. George rightly figured that there are many businesses in the US not much different than his own, but who've presumably had computerized accounting systems online for years, so it shouldn't be necessary to spend a fortune reinventing the accounting software wheel.

He continued his search by checking with his company's trade association. Many such associations have identified, tested, and endorsed vertical accounting software—software specific for that industry. In this case, however, the nature of Multinothing's operations really did not require a highly specialized, industry-specific package.

Even so, as he learned more about what each program offered, and met repeatedly with his staff for feedback, it didn't seem that even high-end off-the-shelf software would be a perfect solution. Several services provide up-to-date information about accounting software currently available, including various modules and add-ons produced by third-party developers, that can be quite specific. They are especially helpful where a company's needs are more specialized or complex.

From the preliminary shopping it is easy to see that any package would continually need updating and, if you are not careful, may be outdated or unsuitable in a few years. At this point, George turned to me for advice and assistance in assessing the company's needs.

OPTING FOR A CONSULTANT

His first question, of course, was for a ballpark estimate of what a needs assessment and system setup would cost. Multinothing, Inc., was fairly typical of the size and complexity of a company that would use high-end generic packages, so I very roughly estimated $5000, excluding software, as a working figure at current Bay Area prices. This estimate was supported by a 1990 American Institute of CPAs survey, reporting an average engagement fee for CPAs of $4178, excluding software, nationwide. Upon hearing this, George shuddered. "When I first got into this business," he thought, "$5000 could buy you a college education."

In an effort to cut costs, George considered relying on software retailers he had visited, or perhaps a consultant who was not an accountant. The prices were significantly lower but, he soon realized, so was the expertise. These advisors, he noticed, seemed to be asking even fewer questions than he initially had about the particular needs

RESOURCES:

"1990 American Institute of CPAs Microcomputer Conference Survey"
Journal of Accountancy
July 1991, p 79.

Services that offer descriptions of accounting software:
ICP Software Information Database
International Computer Programs, Inc.
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David Simon, CPA (M.S., Taxation), is in tax and accounting practice in Oakland. His clients include a variety of professionals and businesses. He can be reached at (510)893-5753. Jennifer Robin Cherniss is a free-lance writer living in Berkeley.

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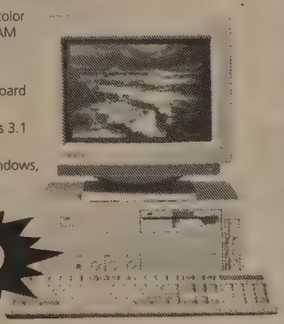
- 1024 x 768 SVGA 14" non-interlaced monitor
- 16-bit 1024 x 768 256 color SVGA card with 1Mb RAM
- TEAC 1.2Mb & 1.44Mb FD drives
- 101-key enhanced keyboard and serial mouse
- MS-DOS 5.0 & Windows 3.1 installed
- Compatible w/DOS, Windows, Xenix, etc.



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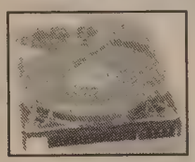

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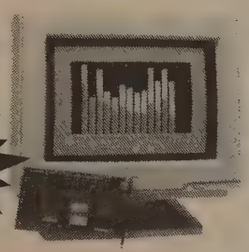

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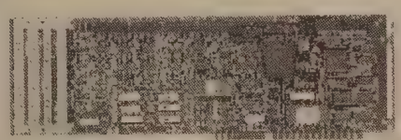
- Expandable cache size up to 16Mb using 4 SIMM sockets (Øk installed)
- Uses 256k, 1M and 4M x 9 80ns SIMM sockets (1 SIMM minimum required)



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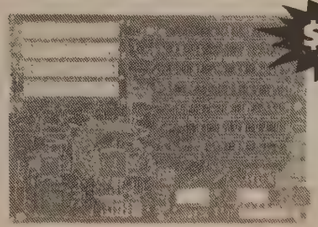

50MHz 486DX Board	33MHz 386DX Board
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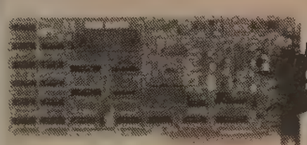

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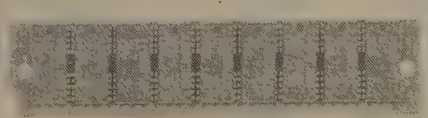

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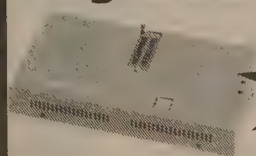

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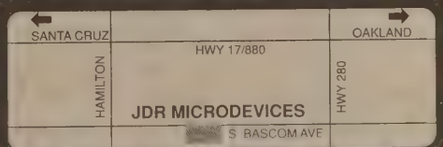

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The Accounting Library
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Richmond, VA 23235
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The Center for Accounting Software Evaluation (CASE)
University of Texas
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of his company. (According to the same survey cited above, nearly half of the typical CPA's microcomputer consulting engagements involve redoing work which was botched by somebody else. Some of the botched jobs can be bad enough to wreck a business.)

In a larger operation, management would name a team comprised of accountants and computer experts to assess the entity's needs. Here, of course, that would be excessive. In the world of companies whose needs are too much for low-end packages but not complex enough to warrant the "big guns," many could benefit from the analysis of a certified public accountant.

STAFF RESOURCES

As a first step, we examined the accounting and computer skills of the people who will be using the system. Learning a new accounting package is time-consuming, and may require varying degrees of user sophistication. A major factor determining the success of software installations can be the competence of the people using the software; even the most carefully planned accounting system may fail if the bookkeeper is unable to master it.

Realistically, a company will usually need to weigh the benefits offered by a desirable system with the cost of improving and maintaining the skill level of the staff—many opt for less than ideal software rather than extensively retrain or replace current employees. As part of the assessment, consider employee turnover, the operators' current experience, and whether operators will need to be enrolled in a special training program.

A competent accounting consultant should provide some staff training as part of the installation procedure. Depending on the package and the complexity of the installation, the software vendor itself may offer the training. To give George Goodigoodi a sense of the relative ease with which I anticipated his staff would get up to speed in any of the programs we were looking at, I contrasted this case with that of a half-billion-dollar manufacturer of doorbells using a mainframe accounting system. The requirements imposed for a mainframe system meant that a core team of staff accountants were sent for a month-long training program at the vendor's facilities.

THE BASICS

The basic building blocks of an accounting system are general ledger, accounts payable, and accounts receivable. These are purchased as separate modules in most high-end accounting software, as are various other add-ons. The modules and add-ons vary, from package to package, in sophistication, capacity, and flexibility. Think of an accounting system as a tree, the trunk of which is general ledger and all the other modules, the limbs. Not all companies need to have the tree shaped the same way, and some could do fine with just a single-stemmed cactus for a general ledger.

George's system will need not only these two main appendages, but also branches which integrate with other applications software and non-accounting information, such as marketing data.

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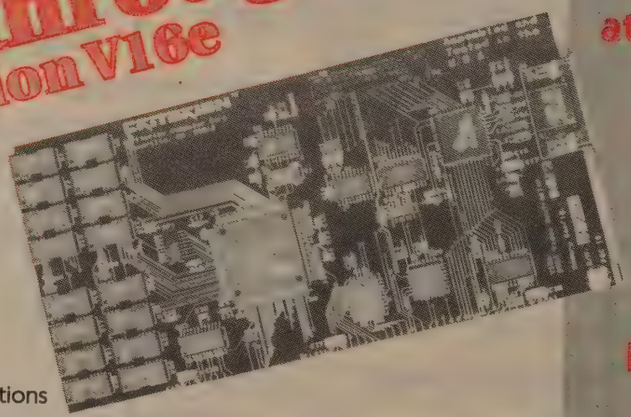

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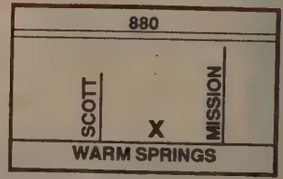

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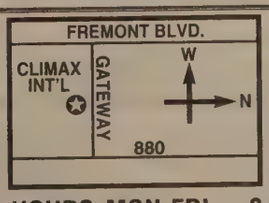

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THE GENERAL LEDGER

One part of the general ledger is that in which journal entries (debits and credits) are entered, and to which transactions can be imported from other modules. A service provider, such as a doctor's or lawyers office, might operate quite adequately with the simplest general ledger providing basic reports. In these situations, Intuit Quicken with a flexible time and billing package can handle the task. The volume and complexity of Multinothing's transactions, of course, made this approach out of the question.

Typically, another part of the general ledger module is the report writer, which generates financial statements by accumulating totals and presenting them in a polished format. High-end systems permit the user to design reports to their own specifications, but packages vary in their trade-off between ease of use and degree of flexibility in this regard. Some packages, such as AccPac, use a rather complex system of codes or symbols to program reports, but third-party add-ons are available to simplify the design process.

Some of the report features that George wants are the ability to track budgets on general ledger accounts. He needs to analyze retail sales and evaluate marketing effectiveness. He wants month-to-date and period-to-date reports, and the bank wants him to regularly compute financial ratios. As George's accountant, I want to furnish the bookkeeper with adjusting entries at the end of each period which should automatically reverse out the next period. These are all functions which are generally addressed in sufficient detail for George's purposes by most of the high-end "generic" accounting packages which support retail operations.

As part of the assessment, consider employee turnover, the operators' current experience, and whether operators will need to be enrolled in a special training program.

ACCOUNTS PAYABLE

Multinothing needs an accounts payable system that goes beyond tracking and paying bills; it must handle discounts and partial payments, direct money in and out of multiple checking accounts, handle purchase orders, and control cash outflow.

ACCOUNTS RECEIVABLE

The accounts receivable module for George's company will need to

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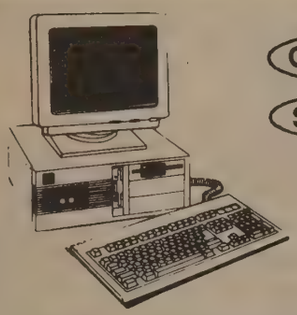

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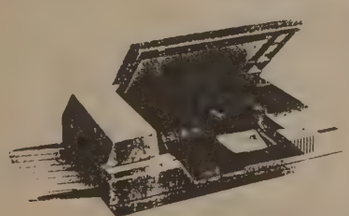

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do more than issue invoices. It will manage collections, identify customer buying behavior, and evaluate a customer's credit. AccPac and Great Plains have receivable enhancements which generate shipping and billing reports, bills of laden, and remittance advices, and which are designed to support larger retail operations.

In accounts receivable, some of George's customers apply payments to specific invoices, while others use the "balance forward" method. He'll want to be sure that the accounts payable module of the software he eventually selects will permit the user to record such determinations with ease.

Multinothing, Inc., also needs to track receipts to the sales staff. The sales manager wants to know how productive each sales person is; also, the staff gets paid a commission based upon sales. Clearly, George's accounts receivable package will have to rate high in functionality.

In service-oriented entities the accounts receivable limb can be heavier than the general ledger trunk itself (my tomato plants at home would illustrate this nicely). For a busy, multi-partner medical practice, for example, I'd recommend one of the popular medical or dental billing programs such as Medpac and Dentpac. They list for around $3000 or $4000. Even though these packages don't even include general ledger or accounts payable, those functions are comparatively incidental and can be handled by any number of basic accounting packages which list for under $350.

A company will usually need to weigh the benefits offered by a desirable system with the cost of improving and maintaining the skill level of the staff—many opt for less than ideal software rather than extensively retrain or replace current employees.

SEEING THE RESULTS

By performing a minimum needs evaluation, it is often possible to eliminate many packages and choices on the first pass. After this stage is completed, it is easier to examine each program and narrow the field to the point where comparisons can be made based on ease of use for your staff. It doesn't hurt to do some general shopping and familiarizing yourself with the market before conducting an in-depth analysis, but a great deal of time and expense can be saved if the full range of your accounting needs and opportunities, integrated where possible with other management functions, are studied early in the game.■

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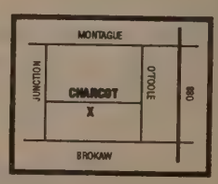

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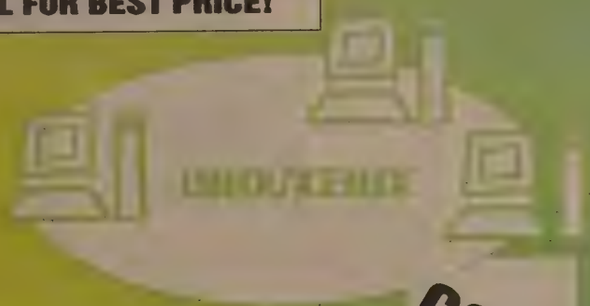

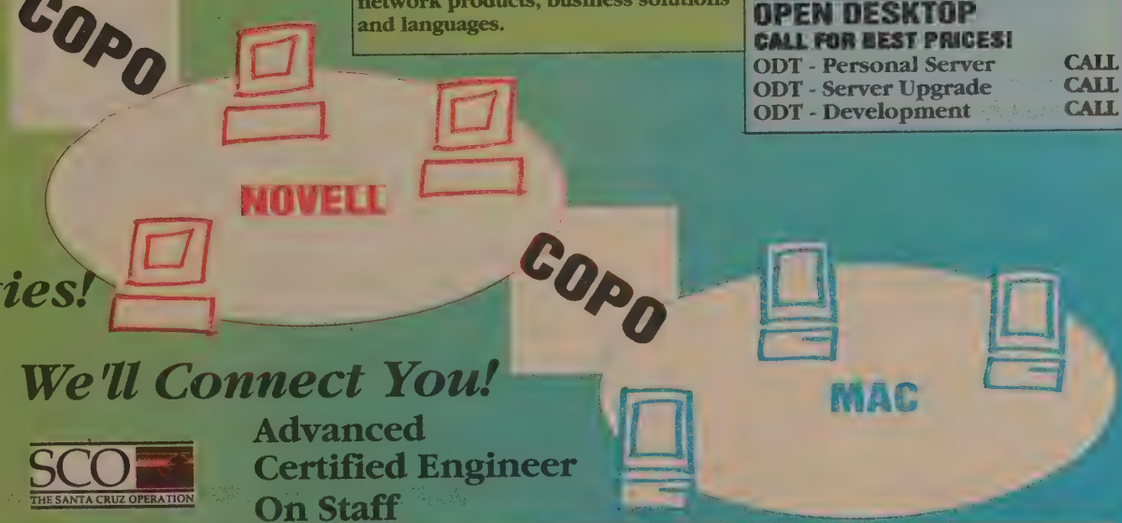

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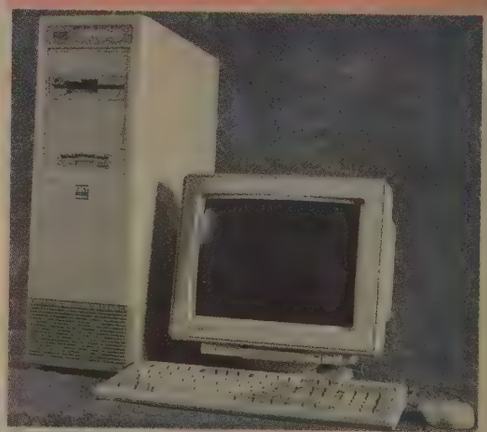

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Telecommuting

Working More Effectively From Home

BY ROBERT MOSKOWITZ

Telecommuting is a simple concept: the process of using advanced technology to work productively outside the traditional office environment. With more and more devices reaching the market that are portable enough for telecommuting and inexpensive enough for broad-based deployment, telecommuting has become a viable, cost-effective option, attracting the attention of both large and small organizations.

"I'm doing some telecommuting right now," said Bill Clay, AT&T's Branch Manager for Commercial Markets in California and Nevada, as he talked on the telephone last week. The global telecommunications and computer company has embarked on an aggressive program to put at least some of its divisions out on the street, through a technology-intensive retrofit called "the virtual office." Although he was in New York City last week for a regular round of corporate meetings, Clay had his laptop computer with him, and spent much of his time in communication with people in California and Nevada who work in his division. "I'm steadily in contact with them," he says, proudly.

The basic idea of telecommuting is to replace or supplement physical travel to the office by using modern telecommunications equipment—the computer network, the fax, the telephone, voice mail, and so forth—to bring office resources and information out to the person. A "core" group of employees maintains the central office and provides secretarial, administrative, and support services during normal business hours for those who are in the office that day, as well as those who are telecommuting.

Rather than do all their work at a central office, telecommuters work at least part of the time at home, in their cars, from clients' offices, and/or in hotel rooms and telephone booths. By using portable computers to link into company data networks, fax machines to send and receive documents, and telephones to conduct meetings and to interact with colleagues and support staff, telecommuters can accomplish at a distance everything—or nearly everything—they can accomplish in the home office. By carrying pagers and frequently dialing into the organization's voice mail system, telecommuters can remain in close, frequent contact not only with coworkers, but with clients or customers who expect rapid call-backs from those they try to reach.

According to Bill Clay, his organization is heavily dependent on telecommuting, which AT&T calls the "virtual office." So far, everyone in his organization who sells long distance services to business clients has been equipped with an NCR Safari portable computer containing a 386 processor, 2MB of memory, a 40MB hard disk, and a modem. They have also been issued a portable battery operated letter-quality printer, a cellular telephone, a pager, and in many cases a fax machine. In the future, the computer modem will be replaced with a cellular one, adding even more portability to this "virtual office."

AT&T's telecommuters can use their computers to access any of the AT&T systems they need, such as electronic mail, an online library of information on tariffs and products, a billing system to get information about customers' present services and calling patterns, and so forth. The Safari computers have word processing installed, so people can write a letter or a memo, then conveniently email it to a secretary in the main office. By selecting a list of customers from the online database, people can have the same letter merged with personal information and a custom copy sent from the central office to each person on the list.

This approach to doing business is not only reducing costs for AT&T, it's improving results. That's why Bill Clay spends so much of his time overseeing the process and making sure that the "virtual office" is working for all of his people.

Many people still think of telecommuting as a fringe activity not fit for mainstream organizations. They argue that people who escape direct observation by front-line supervisors will not be productive enough to justify their employment. But recent experience shows that telecommuting, properly planned and administrated, is actually a very efficient alternative to traditional office-centered activity.

In addition to AT&T, employers in pharmaceuticals, computer hardware and software, manufacturing, utilities, and other in-

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When local networking started just a few years ago, the principal reason for installing one was to share resources. High-quality printers and large hard disks were quite expensive, and it made sense to connect them to as many users as possible. But as those economics have changed, so have local-area networks.

Today, it's growing more likely that workstations are connected to share information than to share hardware, and the ability to collaborate on work in progress is emerging as the most potent way networked information is shared. Electronic mail, WordPerfect Office, and ON Technology's Meeting Maker are representative of the products that are the focus of this change.

However, groupware by itself can't help if your work force, and their work, is spread across the nation—or even across town. That type of application is beyond the scope of LANs. Nevertheless, companies are working with applications, not only across the country, but around the world. They are doing it with wide-area networks (WANs). WANs provide the ability to connect two distant networks as though they were in the same location.

WANs provide the ability to connect two distant networks as though they were in the same location.

The WAN is more than just a network distributed across a large geographic region. Locally, it employs conventional LAN media and protocols such as Ethernet or LocalTalk, and these local segments can be connected directly. But it isn't feasible for most companies to string coaxial cable from coast to coast, or twisted pairs from New York to Paris. So, WANs are typically connected through an intermediary service and special hardware devices.

WAN OPTIONS

Common carriers offer several classes of service that can provide this channel, depending on the capacity and speed required by the application. One class, called Digital Data Service (DDS), uses either switched or dedicated 56Kbit lines. The switched (direct-dial) version of DDS, for instance, is called switched-56 service. It employs 56Kbit, data-only, conditioned, digital, synchronous, dial-up lines.

Integrated Services Digital Network (ISDN) is a digital service with 64Kbit capacity, and multiple lines can be combined for 128Kbit or higher speeds. It also allows simultaneous data and voice.

T1 service is simply a bundle of twenty-three DDS lines that provide data rates up to 1.5Mbits/second. Even faster applications can be supported by new services like the 51Mbps Synchronous Optical Network (SONET), and the 1.54Mbps to 155Mbps Switched Multimegabit Digital Service (SMDS). SMDS supports Ethernet, Token Ring, and Fiber Distributed Data Interface (FDDI).

Of course, a WAN can also be based on common analog phone lines and a modem, but for any WAN a special type of router is required to bridge segments. As with any router, these devices isolate traffic, and extend physical limitations. However, they differ from conventional bridges and routers, because they must work in pairs—one at either end of a line. Hence the name "half router."

The half router connects to a LAN, or to a gateway connected to a LAN, on one side, and to one or more pieces of facilitating equipment on the other. For DDS lines, the router is connected to a Digital Service Unit/Channel Signaling Unit (DSU/CSU). For ISDN lines, the router is connected to an NT1 (network termination device) and a terminal adapter. T1 lines require the addition of a multiplexor. These other devices are, in turn, connected to the channel.

WANs aren't always simple to install, because the required phone services aren't widely available yet. ISDN will eventually be provided everywhere, even as a residential service, but it's still going to take a while longer for all the local loops to be converted to digital. This issue alone makes implementing a WAN for a dedicated internal application easier than providing it to clients as a service.

CURRENT APPLICATIONS

Nevertheless, some work-group applications have such a pressing need for connectivity that WANs are beginning to appear as service bureau-client connections. Desktop publishing is one of these application areas. Several times in past columns, I've talked about its need to evolve support for the work-group metaphors of traditional publishing.

One New York desktop-publishing service bureau is, in fact, pioneering WAN desktop-publishing services for its customers. Business Link offers a 56Kbit WAN service, called the Desktop Imaging Network, to clients as a complete package. The company provides and installs all of the required software and hardware, including Farallon's Timbuktu/Remote and a TransTalk half router from International Transware that works with just about any type of WAN, digital or analog. In certain areas where 56Kbit service is rather expensive (such as those served by Atlantic Bell where rates for 56Kbit service are as much as four or five times higher than the nation's lowest), Business

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Romero's eight-Macintosh New York AppleTalk network is currently connected to the service bureau via AT&T's switched 56Kbit ACCUNET service, and uses it to send files for

Today, *it's growing more likely that workstations are connected to share information than to share hardware.*

comps, films, and other separation work. Business Link processes Romero's PostScript files, and delivers output from one of its image setters, or a Dupont 4Cast dye-sublimation printer, by 9:30 the next morning. When Madrid joins the network, Romero will also be able to approve proofs online without leaving his desk.

By mid-July, another Desktop Imaging Network client, Wilcox & Associates, will be using the service to network its offices in San Francisco and New York. "The local project managers will be able to review creative concepts, and present them to clients on a real-time basis," claims President Bob Wilcox. Wilcox creates sales-promotion and direct-mail programs—and already uses the WAN

continued on page 79

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- 213MB 15ms IDE HARD DRIVE
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- 1MB 16bit VGA (1024x768) card
- 2HD/FD controller w/2S, 1P, 1G ports
- 1.2MB and 1.44MB floppy drives
- 8 Expansion slots
- 101 Enhanced keyboard
- Built-in math coprocessor
- Weitek coprocessor socket
- Clock/calendar w/battery backup
- Vertical case with power supply
- MS DOS 5.0 & Windows 3.1
- 3 Button High-Resolution Mouse

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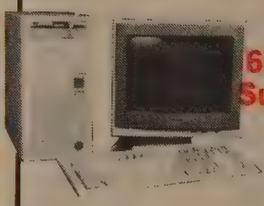

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- 2HD/FD controller
- 1.2MB and 1.44MB floppy drive
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- Weitek coprocessor socket
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- 3 Button High-Resolution mouse
- MS DOS 5.0

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- 2 Terminators
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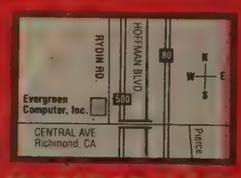

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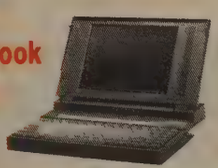

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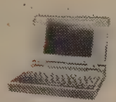

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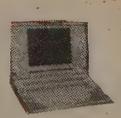

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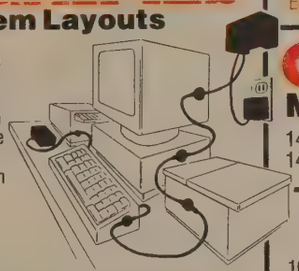

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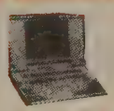

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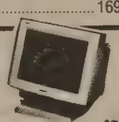

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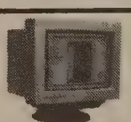

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15"	4FG	1024x768	28mm	759
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Panasonic KX-P4420	N/A	139	175	189
IBM 4019	109	149	309	N/A
Epson EPL-6000	140	155	190	N/A
Epson EPL-7000	N/A	90	140	N/A
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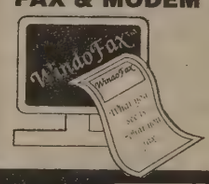

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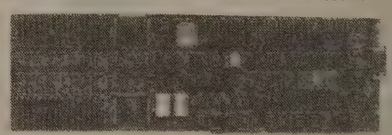
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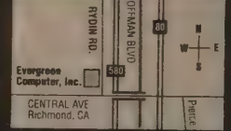

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to provide related products that include direct-mail pieces, corporate literature, brochures, and other collateral material—for financial-industry clients such as Wells Fargo, Bank of America, Citibank, and Chase Manhattan.

Wilcox & Associates has, atypically, placed all of its composition, layout, and production work into the hands of Business Link over the WAN. "Wilcox turned over his art department," says Business Link President Todd Melet. The service bureau does a design based on specifications, and the creative director at Wilcox manages the final composition of the document in real time.

***Companies** are working with applications, not only across the country, but around the world. They are doing it with wide-area networks (WANs).*

"In the old days," Wilcox claims, "you either had to camp out at the typesetter, or send it back and forth over and over." Working with Business Link online lets Wilcox focus his staff's creative talent entirely on client needs without losing the fast turnaround he requires. "A lot of our work is merger related, which means there's a very short lead time. If we don't like the drop shadow," Wilcox explains, "we say, 'Let's lighten that up to a 70% tint.'" The bureau prints proofs remotely on Wilcox's laser printer, and after approval, the files are imaged at Business Link.

Ordinary phone lines can also be used in some applications without creating a WAN. Farallon Computing itself is an example of a company that's networking with a 9600bps modem to review and approve comprehensive ad layouts (comps) at its Salt Lake City advertising agency, Dahlin, Smith, White (DSW). "It takes a process that generally requires two to three days and does it in a morning," says DSW account executive David Blain. The review process ordinarily takes longer, because DSW must overnight hard copy of its ads to the client and wait for a response. If changes are required, the process must be repeated—sometimes more than once.

For Farallon, DSW scans comps at low resolution, and displays them on a 14" monitor using Adobe Photoshop. Farallon uses Timbuktu to interact with the designer online, and make necessary changes. Due to its narrow bandwidth, this system doesn't support high resolution, or rapid transfer of large graphic files; and because it lacks a half router it doesn't connect their local networks. However, even subtle design elements such as color are available for review.

Its client's success has encouraged DSW's own investigation of true WAN solutions. Blain says that improving turnaround with this technology is paramount for DSW: "The ability to get the client's message into the market faster gives them a competitive advantage, and that gives us an advantage as an agency." The company is now considering using a 56Kbit WAN to transfer font files from its typographer and EPS files to its printer.

Despite certain limitations, the more widespread availability of 56Kbit service gives it a definite advantage over ISDN. International Transware President Eric Gould says, "A lot of people think they have to wait for ISDN, but they don't. Any 56Kbit service will give them comparable performance—usually at a lower cost." Gould also maintains that DSUs are cheaper than the terminal adapters required by ISDN, and in some cases, even the service is cheaper today. ■

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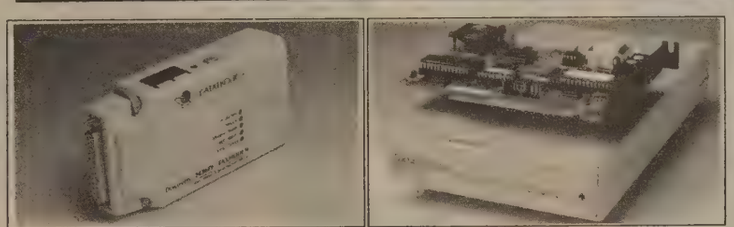
24/96 V.42bis MNP FaxModem



- 2400bps Data Modem, 9600bps Send/Receive Fax
- V.42bis, V.42, MNP2-5 for 9600bps Data Throughput
- DOS Fax Software included, Window version optional

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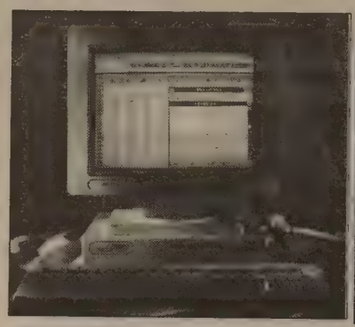

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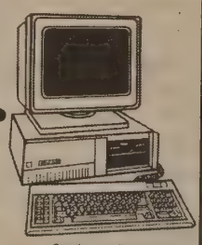

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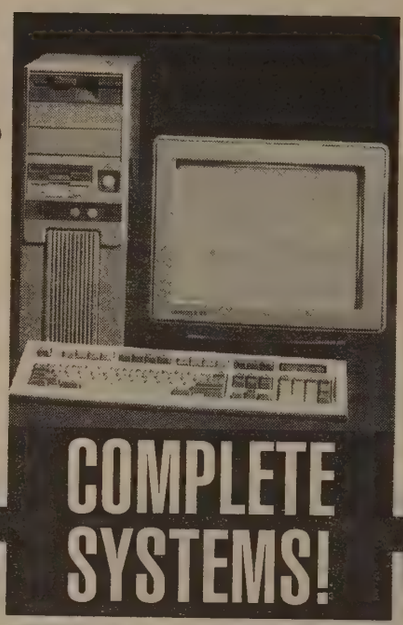

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- 2 MB RAM (expandable to 32)
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- **Color VGA Monitor**
- **85 MB HD**
- 101 keyboard • 4 MB RAM
- AMI BIOS • 64K cache

1.2 & 1.44 FD

- FCC Class B
- 8 expansion slots
- 6 drive bays
- DOS 5.0/Windows 3.1
- 1-year warranty

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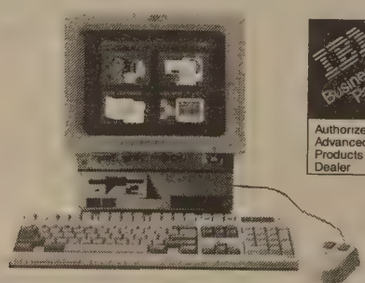

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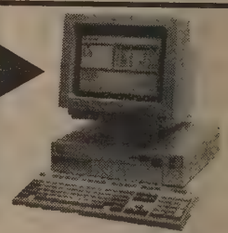

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At 6 or 10 pages per minute with Print Quality Enhancement and Scalable Fonts, these printers outperform the rest. Paper handling includes 200 sheet input tray with an optional 500 sheet drawer and 75 piece envelope feeder. When you add the optional PostScript™ and 4 MB of memory, this printer provides the most affordable 600 x 600 dots per inch technology available today. HP PCL4 compatible; optional PCL5.

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IBM introduces 2 new 9 pin printers that can print crisp, six-part forms. Thick paper stock is no problem for their new straight paper path technology. Solid and reliable, these printers perform flawlessly.

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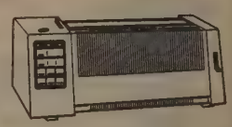

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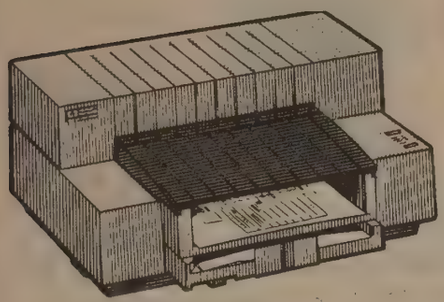

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HP DeskWriter Printer

Get laser-like 300 dpi quality from your Apple® Macintosh® or AppleTalk® network, at a price lower than many dot-matrix printers. There's a good reason why these sell as fast as they come in.

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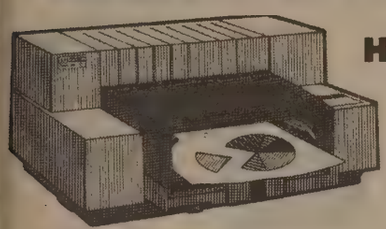
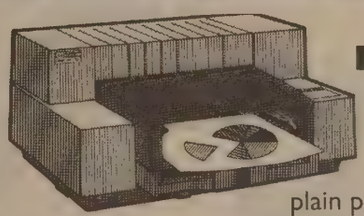


HP DeskJet 500 Printer

The DeskJet 500 has been hard to find, but we found some! DOS and Windows users can once again enjoy 300 dpi b&w printing at a small fraction of the price of a laser. Use it with your font-scaling software for beautiful documents.

$399.



HP DeskJet 500C Printer

Get 300 dpi laser-quality color printing on plain paper and transparencies, for persuasive design and presentation power at a fraction of the cost of a color laser printer. Supports all major software including Windows; 3-year limited warranty.

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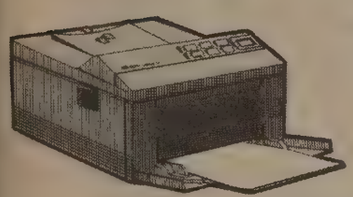
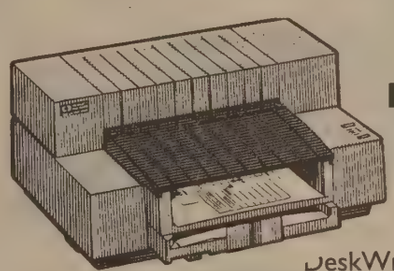


HP LaserJet IIIP Printer

Whole Earth makes the super-advanced but hard-to-get LaserJet IIIP available again. It's compact but powerful, with faster print speed than other printers in its price range, plus built-in type scaling and upgradeability to PostScript for PC and Macintosh.

Limited quantity.



HP DeskWriter C Printer

The new HP DeskWriter C adds color capacity to the DeskWriter's already-famous laser-quality black output. It's compatible with popular Macintosh® software and your budget.

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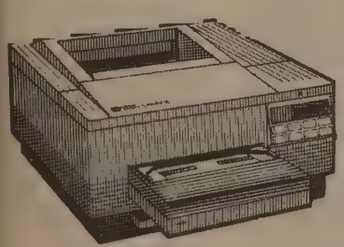

HP LaserJet III Printer

The industry standard in laser printers, the 8-page-per-minute LaserJet III offers snappy, dependable 300 dpi performance and reliable paper handling. Keeps up with the heaviest print loads.

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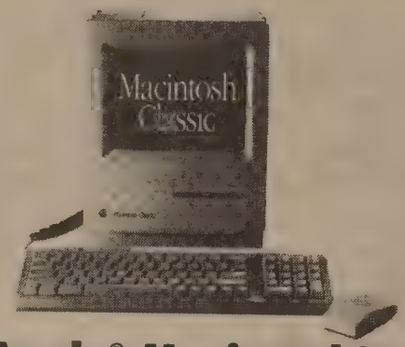

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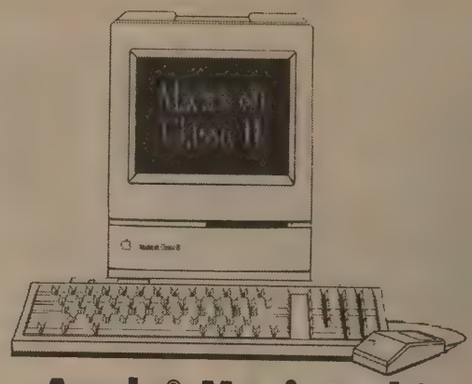

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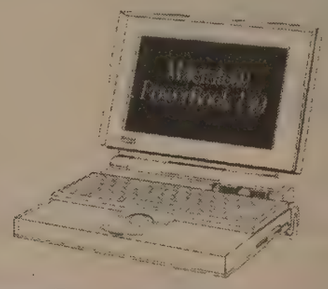

Apple® Macintosh® LC II 4/40

For presentations, education, kids, the sciences, and the arts, you need color! And there's no easier color computer to use than the affordable LC II, with its slender modular design and ability to run all your favorite software. *Monitor extra.* **$1299.**

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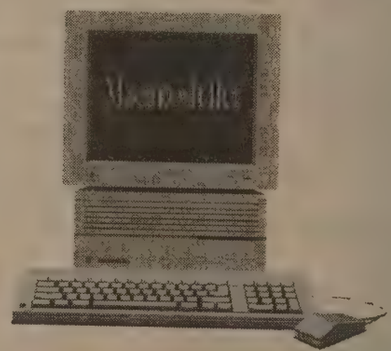

Apple® Macintosh® IIsi 5/80

The Macintosh IIsi boasts an expandable combination of color and sound capabilities, with a small footprint that makes it a great fit in any home or business. The kids will love this one for games; you'll appreciate its speed and expandability. 5MB RAM/80 MB HD. *Keyboard/Monitor Extra* **$2299.**

Apple® Macintosh® IIci

The IIci gives you power with room to grow, including built-in flexible video support and an optional cache card for increased performance. Businesses will love its number-crunching speed; creative types will appreciate the way it juggles color graphics. 5 MB RAM. *Monitor and keyboard extra.* **$2999.**

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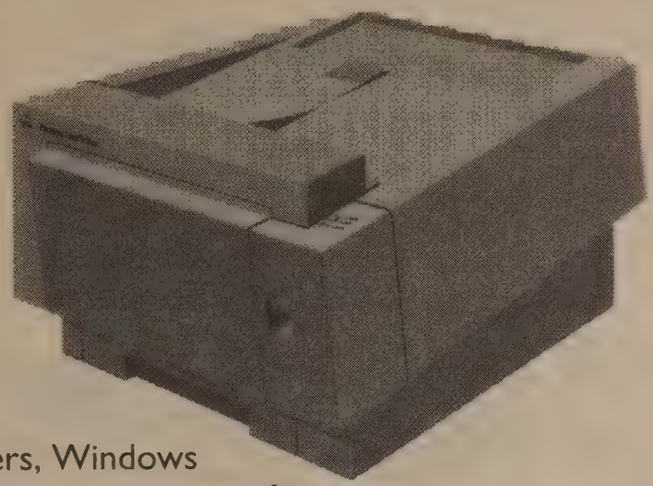

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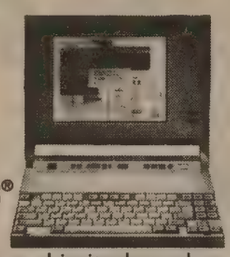

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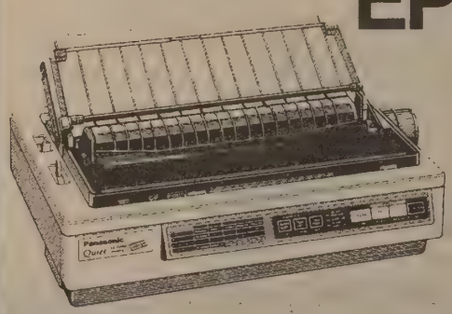

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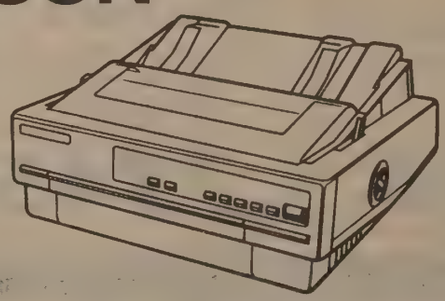

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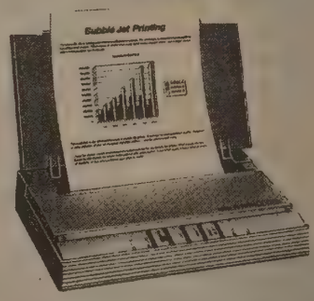

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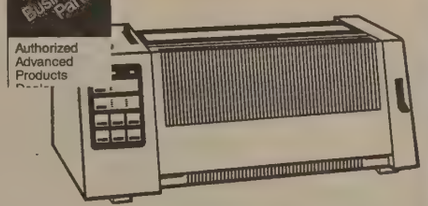

IBM® PPSII 2380

IBM takes dot-matrix printers as seriously as you and your business. The PPSII's straight paper path means six-part forms and thick paper print right the first time.

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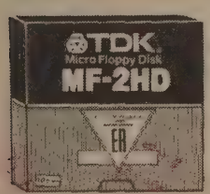

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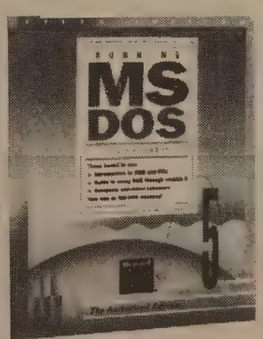

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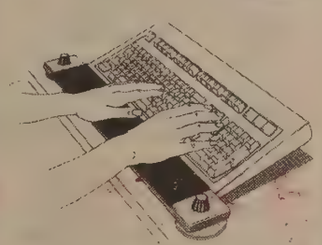

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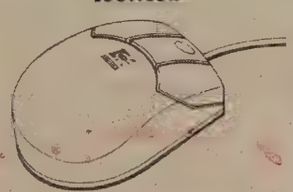

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- Landmark=57
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- 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Socket for 80387
- Tower or desktop case w/power supply
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- Supports MS-DOS, OS/2, Unix, Xenix

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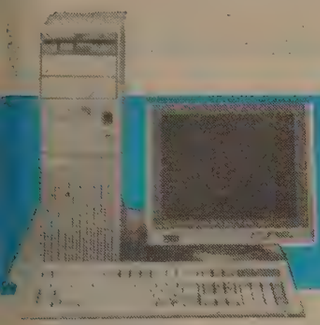
- 101 Enhanced Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix



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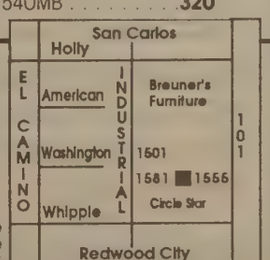

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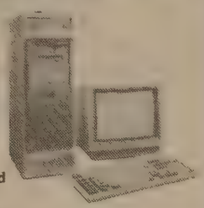

- *Intel 486DX-33/50DX2
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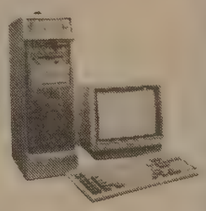

- *Intel 486DX-33/50DX2 MHz
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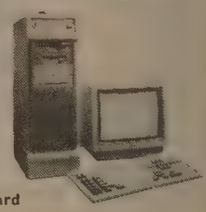
- *4MB DRAM 70ns (up to 32MB)
- *120MB 15ms IDE Hard Drive
- *SAMSUNG SyncMaster 3 1024x768 0.28dp SVGA monitor
- *Trident 8900C 1024x768 w/1MB SVGA Graphic Card
- *TEAC 1.2MB Floppy Drive
- *SONY 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- *Tower Case w/230 Watts Power Supply
- *Microsoft DOS 5.0 Package

Complete Sys. $ 1589/1739
(486DX-50 add $ 140)

ORCHID 486DX-33/50DX2 32-Bit Local Bus Graphic



- * Intel 486DX-33/50DX2
- * 256KB WriteBack Cache
- * 4MB DRAM 70ns (up to 32MB)
- * Conner 170MB IDE Hard Drive
- * ORCHID Fahrenheit 1280D 32-Bit Local Bus Slot w/ 1MB & Hi-Color
- * TEAC 1.2MB Floppy Drive
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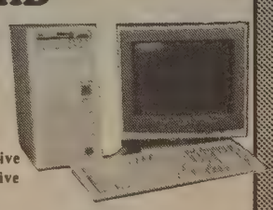
- * KeyTronic 101+ Enhanced Keyboard
- * Logitech 3-Button Mouse w/ Pad
- * 2 HD/2 FD IDE Controller
- * 2 Serials, 1 Parallel, & 1 Game Ports
- * Tower Case w/ 230 Watts Power Supply
- * Microsoft DOS 5.0 Package

Complete Sys. $1829/$1969
(486DX-50 add $180) (Monitor not included)

386DX-20/25 MHz SVGA 80MB HD



- *386DX-25 MHz
- *2MB DRAM 70ns (up to 8MB)
- *80MB 16ms IDE Hard Drive
- *Super VGA 1024x768 0.28dp Color Monitor
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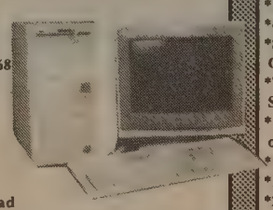
- *TEAC 5.25" 1.2MB Floppy Drive
- *SONY 3.5" 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- *Mini Tower Case w/ 230 Watts Power Supply

Complete Sys. $ 999/1039

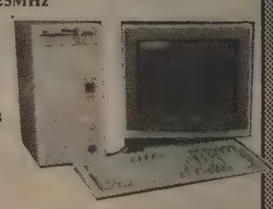
386DX-33/40 MHz ISA 64KB Cache 105MB HD



- *386DX-33/386DX-40
- *64KB WriteBack Cache (up to 256KB)
- *4MB DRAM 70ns (up to 32MB)
- *105MB 15ms IDE Hard Drive
- *SAMSUNG SyncMaster 3 1024x768 0.28dp SVGA Monitor
- *Trident 8900C 1024x768 w/1MB SVGA Graphic Card
- *TEAC 1.2MB Floppy Drive
- *SONY 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game
- *Mini Tower Case w/ 230 Watts Power Supply
- *Microsoft DOS 5.0 Package

Complete Sys. $ 1249/1279

386SX-25MHz SVGA 40MB HD



- *Intel 386SX-16/AMD 386SX-25MHz
- *1MB DRAM (up to 16MB)
- *40MB 22ms IDE Hard Drive
- *Super VGA 1024x768 0.28dp Color Monitor
- *Trident 9000 1024x768 SVGA Graphic Card w/512KB
- *1.2MB Floppy Drive or 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- *Mini Tower Case w/ 230 Watts Power Supply

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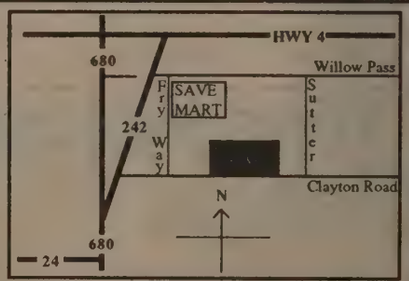

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- SVGA Adapter with 512K Video RAM
- Standard Configuration

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- Standard Configuration

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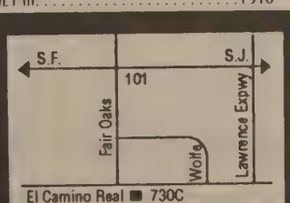

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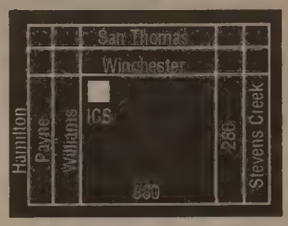

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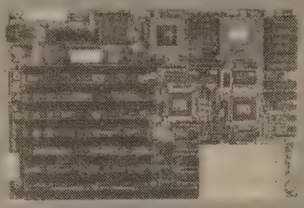

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486/33 ISA 2 Years Parts & Labor	Nice USA	64	1.2/1.44	130MB 15 ms	1MB 16 Bit	1024x768 .28 dp NI	4MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$1579
486 50/33 ISA 1Year Parts & Labor	ICS	64	1.2/1.44	105MB	512K 16 Bit	1024x768 .28 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$1449/ 1259
486SX-25 1 Year Parts & Labor	ICS	64	1.2	105MB	512K 16 Bit	1024x768 .39 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$969
386/40 1 Year Parts & Labor	ICS	64	1.2	105MB	16 Bit	1024x768 .39 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$909
386/SX-25 1 Year Parts & Labor	ICS		1.2	60MB	16 Bit	1024x768 .39 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$769

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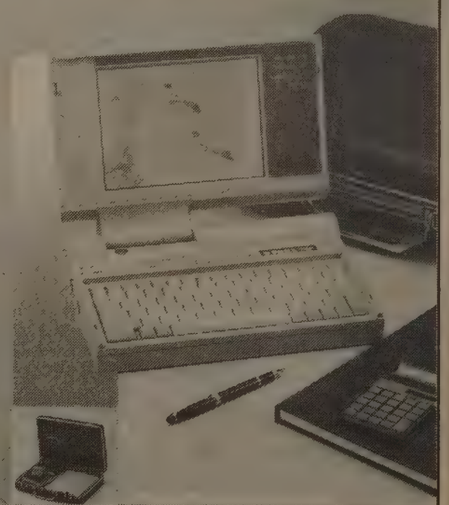

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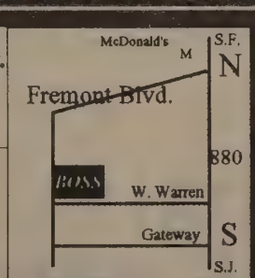

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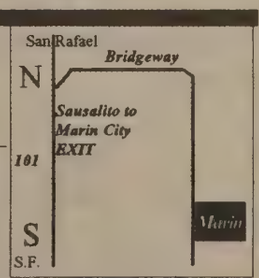

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386SX-25	106	291	570	736	807	886	914	1090
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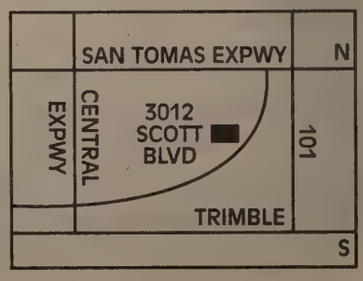

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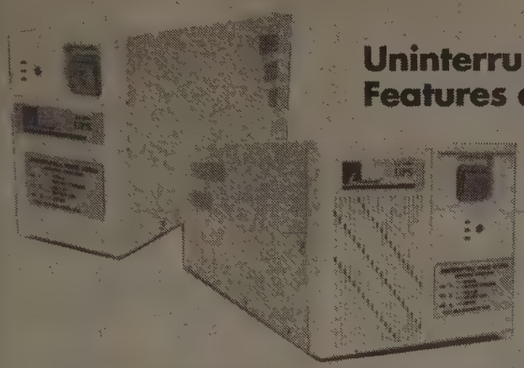

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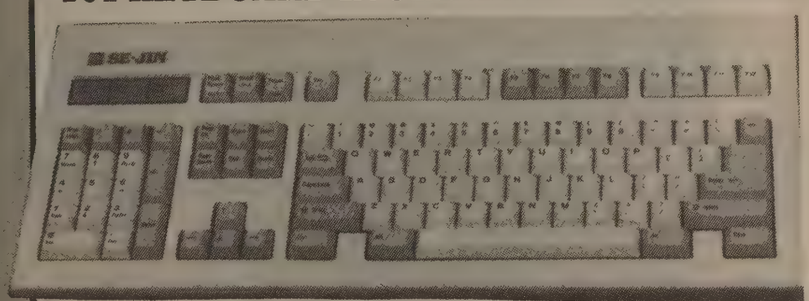

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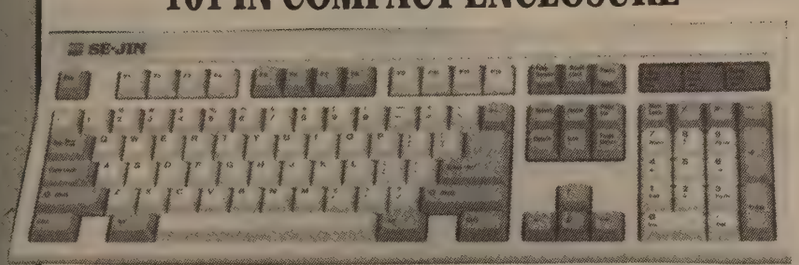

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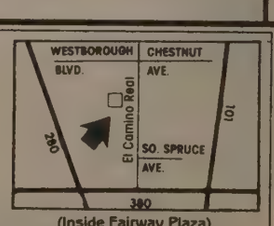

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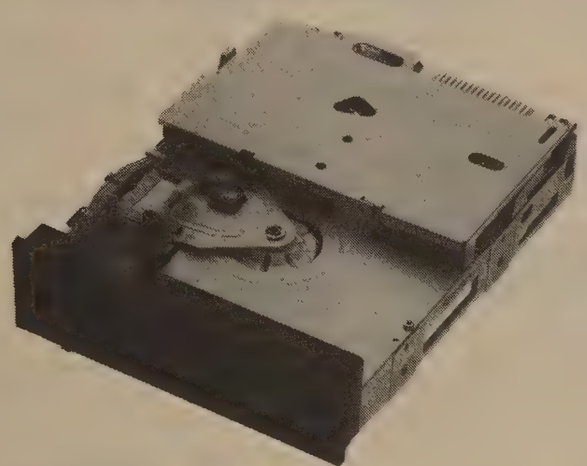

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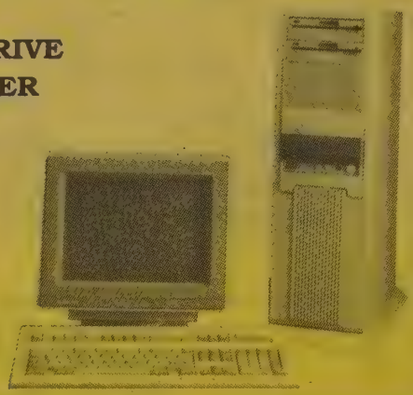

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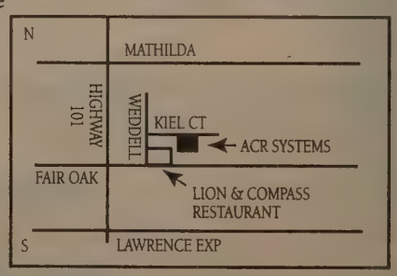

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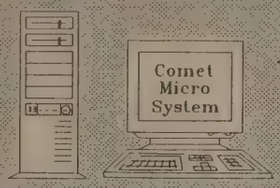

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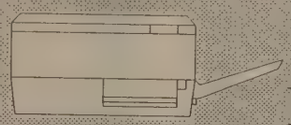

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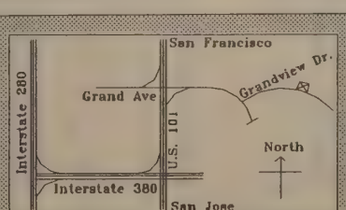

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VGA 256k/512k.....$26
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V7 VRAM II 1MB.....$285
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For Accelerator Boards see Engineering section

BUSINESS CLASS SYSTEMS

286 20MHz
Mini Tower Case, 1MB, IDE Cont. 2SPG, 1.44 Floppy Drv, 40MB Hard Drive, 512K SVGA Crd, SVGA .28 Color Monitor, 101KB, Mouse, DOS 5
WIN 3.1.....$765

386 DX 25/33 w/64K Cache
Medium Tower Case, 4MB, IDE Cont. 2SPG, 1.44 Floppy Drv, 80MB Hard Drive, 512K SVGA Crd, SVGA .28 Color Monitor, 101KB, Mouse, DOS 5
WIN3.1.....$1020/1060

486 DX 33 64/256K Cache
Full Tower Case, 4MB, IDE Cont. 2SPG, 1.44 Floppy Drv, 170MB Hard Drive, 1MB SVGA Crd, SVGA .28 Clr Monitor, 101KB, Mouse, DOS 5,
WIN3.1.....$1535/1570

386 SX 16/25 MHz
Mini Tower Case, 2MB, IDE Cont. 2SPG, 1.44 Floppy Drv, 60MB Hard Drive, 512K SVGA Crd, SVGA .28 Color Monitor, 101KB, Mouse, DOS 5
WIN3.1.....$845/855

486 SX 20/25 MHz
Medium Tower Case, 4MB, IDE Cont. 2SPG, 1.44 Floppy Drv, 120MB Hard Drive, 1MB SVGA Crd, SVGA .28 Color Monitor, 101KB, Mouse, DOS 5
WIN 3.1.....$1120/1155

486 50 DX 256K Cache ISA/EISA
Full Tower Case, 4MB , IDE Cont. 2SPG, 1.44 Floppy Drv, 200MB Hard Drive, 1MB SVGA Crd, SVGA .28 Clr Monitor, 101KB, Mouse, DOS 5,
WIN3.1.....$1910/2295

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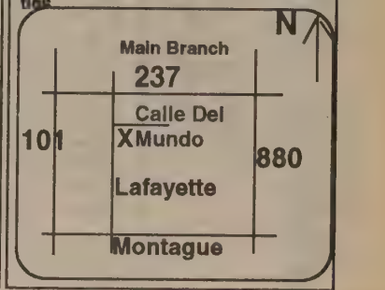

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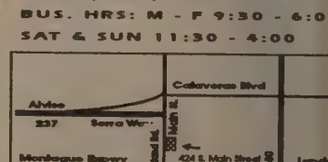

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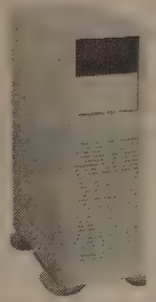

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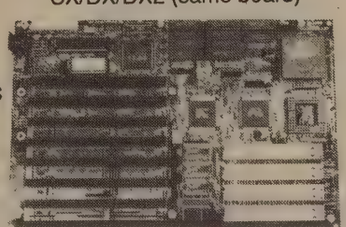

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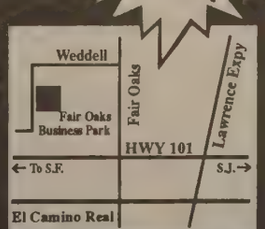

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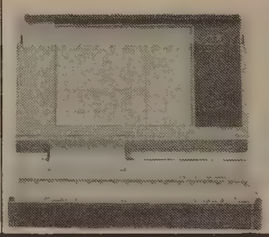

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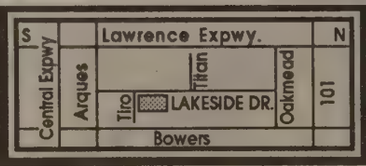

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ULTRASTOR 24F/	454
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EPSON LQ510	235
EPSON LQ570	255
PRINT CABLE	5

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DIAMOND SPEEDSTAR / 1mb	141
DIIAMOND SPEEDSTAR /high color	145
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MGP	11

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MICRO MARKETPLACE

Update: CompuExpo

"The old way of building and distributing PCs is now being challenged by a new paradigm. Today, end-users have a choice of multiple processor architectures, graphics technologies, operating systems, and system definitions. CompuExpo reflects this diversity of new channels, technologies, and system definitions."

—Gordon Campbell, President and CEO, Chips and Technologies, and Keynote Speaker, CompuExpo

The Global OEM Showcase

September 21—24

Las Vegas Convention Center

In this month's Industry Insight, news editor Paul Hoffman discusses the current and impending shakeout in the PC industry, as big-name and other vendors are forced to continually drop their prices in response to intense competition.

For resellers, VARs, and large-volume buyers alike, it's now a life-or-death matter to be able to find products that give the maximum performance and reliability at the lowest cost. Which is why CompuExpo, coming to Las Vegas in September, is a vital resource, bringing together developers, vendors, and customers from around the world—early enough to take advantage of the peak year-end selling season.

MicroTimes is proud to be a sponsor of CompuExpo. We believe that in an increasingly global business climate, it's important to have access to products and markets around the world to deliver the best value.

CompuExpo's exhibitors include companies seeking US, European, and Far East marketing partners; entrepreneurs and startup companies; as well as US-based leading providers of core content and key technology. The show is aimed specifically at PC direct marketers, large-volume end-users, government and corporate buyers; plus VARS, superstores, and mass merchants in search of low-cost suppliers. Products on display will include laptop/notebook/handheld computers, mass storage products, boards and cards, networking hardware and software, printers, multimedia, pen-based computers, and more.

Announced exhibitors include IBM, Chips and Technologies, Maxtor, Western Digital, and Microsoft; both Taiwan and Hong Kong will sponsor technology pavilions.

In addition to the exhibits, conference sessions have been chosen to give attendees strategically important information for their businesses, with topics ranging from "East-West Partnerships" to "Non-Intel CPUs Come of Age" to "Marketing PCs in a Commodity/Price War Environment."

Keynote speakers in addition to C&T's Campbell will include Lucy Baney, PS Director, Programming Systems Market Development, IBM; and Richard Fade, Vice President of OEM Marketing, Microsoft.

For exhibitor, registration and general information, call toll-free: 1-800-822-1229.

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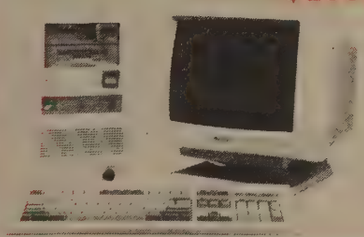

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PC SOURCES May 91 Product Review on SPEAR 386/33:
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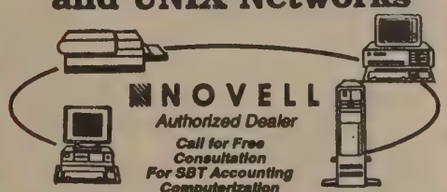

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paper:

Xerox Advanced Document Services crew (l-r): President Paul Ricci, Director of Development Jennifer Ware, and system architect Martin Cooper.

The Quarter-Ounce Portable Office From Xerox

By Mary Eisenhart
Photos: Paul Winternitz

"When we were at PC Expo, we had people walk up to us and say, 'Well, why do I need this? I've got my laptop, I've got my hand scanner, I've got my portable printer. Why do I need this?'

"And we would say, 'Okay, where are they?' And the people would say, 'Oh, back in my hotel room.'

"We'd say, 'Exactly.'

"This sheet of paper is the most portable medium. If you're just going to send, store, and retrieve documents, this is your quarter-ounce laptop. You don't need to carry all that stuff around.

"We're not trying to replace laptops. We're providing another computing tool."

—Jennifer Ware

Who among us has not gone on the road and discovered, usually at 3 am on Sunday, that we've left behind some vital document for a presentation the next morning—scheduled for *hours* before anyone's in our office to deal with the situation?

Or needed to get information from a remote location to multiple destinations in a hurry? Or to see the results of a project that its creators hadn't quite finished when we had to leave town?

Assuming you had your portable computer on the road, along with the right modem, the right software, and a fair amount of luck, you might be able to get what you need. But again, who among us does not have horror stories of modem-incapable hotel phones, sudden battery failure, or any of a host of other problems that separate us from the information we need?

If your computer back at the office happens to be a 386 or 486 running Windows 3.x, and it's set up with a supported fax card and some revolutionary new software from Xerox, your life just got a lot easier. In your nightmare scenario of being stranded in the hotel with your vital information thousands of miles away, all you need to do is fax a blank sheet of paper to your machine from any fax machine you can find (and, as business travelers can attest, fax machines are a lot easier to find than modem-capable phones...).

Within minutes, your computer has taken the blank sheet of paper as an indication that you need something, and faxes you back a form. That, in turn, allows you to request further forms for more specific information, print out that forgotten report, or

Jennifer Ware: "There was a realization one day that people like paper, and that we ought to stop fighting it. Because every time you try to take paper away from people, they scream. Paper is an alternative platform. It's not a replacement, it's a supplemental platform for getting your work done."

route documents on your home computer to multiple fax machines around the world.

You don't need a laptop computer. You don't need a modem. All you need is a blank sheet of paper and a fax machine to get your portable office in full operation.

PaperWorks

Xerox's Palo Alto Research Center has acquired a certain renown over the years as the source of many technological breakthroughs that changed computing forever—and usually, from Ethernet to PostScript to most of the Macintosh interface, went on to become the foundation of somebody else's successful startup. PARC is a research-oriented facility—turning research into actual product has not been its historical function.

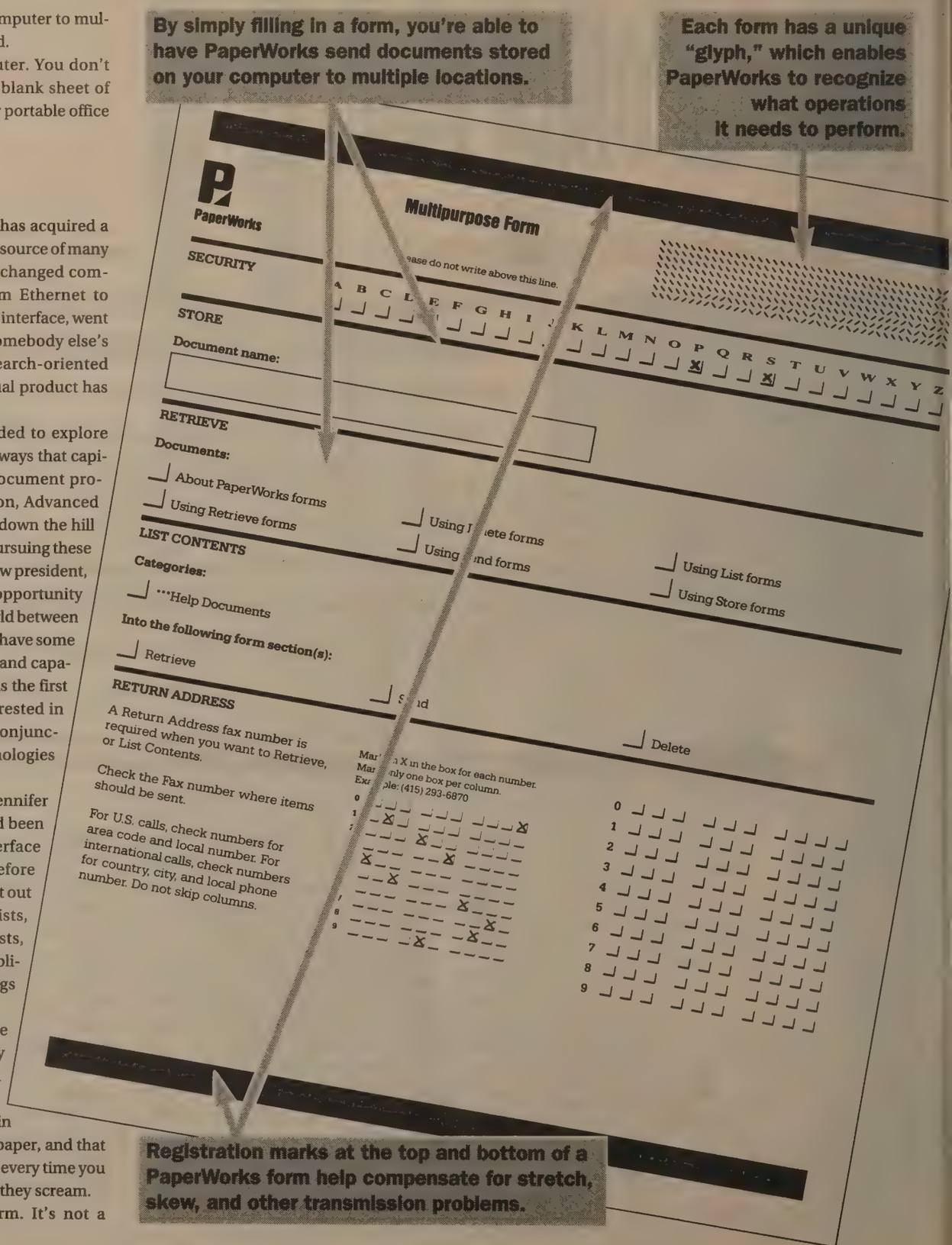
In recent years, Xerox has decided to explore bringing PARC's work to market in ways that capitalized on its other strengths in document processing. The result is a new division, Advanced Office Document Services, located down the hill from PARC itself and dedicated to pursuing these opportunities. Says the division's new president, Paul Ricci, "We believe there's an opportunity to build products that bridge the world between paper and electronic media, and we have some ideas for products that will do that, and capabilities to enable that. PaperWorks is the first example of that. Xerox is very interested in that world, and we're working in conjunction with PARC to take those technologies and market them."

Adds Director of Development Jennifer Ware, "The researchers at PARC had been working with the paper user interface technology for quite a few years before we came on board to make a product out of it. Working with social scientists, anthropologists, computer scientists, they had prototyped a number of applications for using paper to get things done.

"What we did is, we went in there and tried to pick one of the many ideas they had and turn it into a product.

"There was a realization one day in the PARC cafeteria that people like paper, and that we ought to stop fighting it. Because every time you try to take paper away from people, they scream.

"Paper is an alternative platform. It's not a


By simply filling in a form, you're able to have PaperWorks send documents stored on your computer to multiple locations.
Each form has a unique "glyph," which enables PaperWorks to recognize what operations it needs to perform.
PaperWorks
Multipurpose Form
SECURITY
STORE
Document name:
RETRIEVE
Documents:
About PaperWorks forms
Using Retrieve forms
Using List forms
Using Store forms
LIST CONTENTS
Categories:
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Into the following form section(s):
Retrieve
RETURN ADDRESS
A Return Address fax number is required when you want to Retrieve, or List Contents.
Check the Fax number where items should be sent.
For U.S. calls, check numbers for area code and local number. For international calls, check numbers for country, city, and local phone number. Do not skip columns.
Delete
Registration marks at the top and bottom of a PaperWorks form help compensate for stretch, skew, and other transmission problems.

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Paul Ricci: "We believe there's an opportunity to build products that bridge the world between paper and electronic media. PaperWorks is the first example of that."

replacement, it's a supplemental platform for getting your work done. There's certain computational-bound things that are obviously better done sitting at your PC, and there's other things where you can lay out your paper, see all your pages at once. You're not limited by your screen—even though screens are getting bigger, you can really only look at one thing at a time on the screen. There are some things that are just better done on paper."

While users would happily agree that a sheet of paper is often infinitely preferable to many pounds of computer equipment, getting a piece of paper to extract useful information from a computer is a formidable technical challenge.

Explains system architect Martin Cooper, "The key is some pretty heavy-duty image processing code that we have. This is one of the technologies we took from PARC and built into this product, along with the technology involved in the digital data here.

"The image processing code allows us to very quickly determine whether a page is a form, and compensate for, for instance, skew or stretch or shrink on a form, because of problems with the fax transmission. And then the digital data gets us to how we can identify this particular form, once it's in the PC.

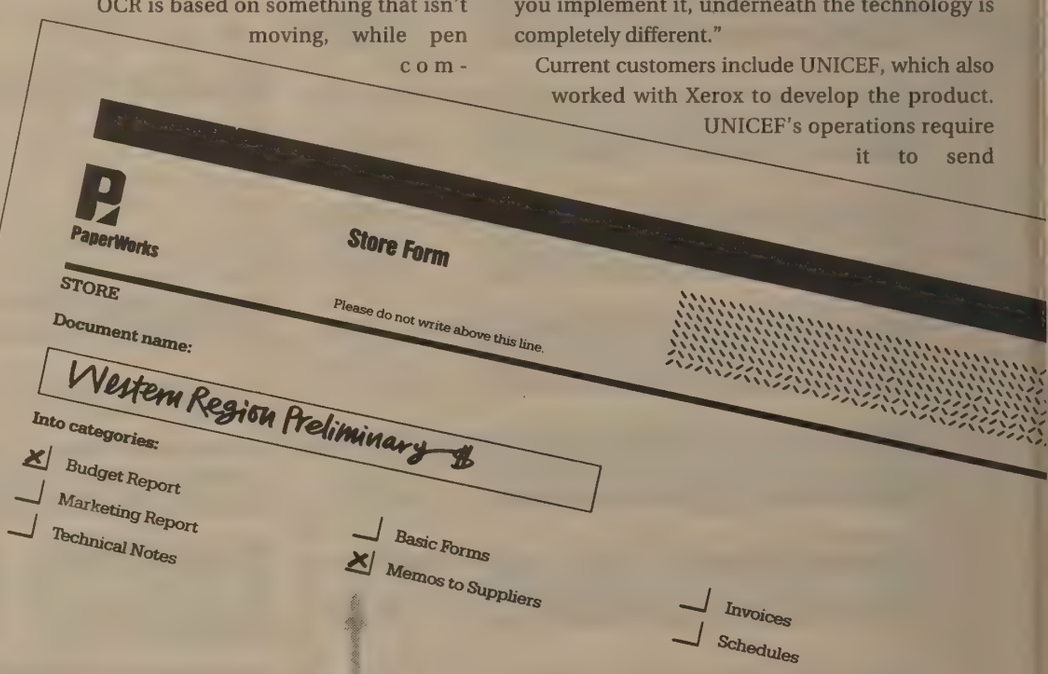
"Once we know what form it is, we can go in and look at the description of the form that's stored on the disk, and then determine where check marks could be, and where handwritten regions could be. And then determine what's checked and what's written in, lift those out, and then interpret them appropriately. A category name that's in the Store section will indicate that whatever document follows this form should be stored in that category. And a person's name on a send form would indicate 'pick out their fax number from the database and use that as a destination.'"

Adds Ware, "You can specify 'Give me a form back that lets me retrieve," or "Give me a form that lets me send this on to somebody else," or "Give me a form that lets me delete that item." It can list all the items you've received in your fax mailbox, and you can specify exactly which ones you want to deal with, instead of all your fax mail. That way you don't have to retrieve all your fax mail, just the specific one. You don't have to pre-create that form, because you don't know what's going to be in your fax mailbox."

While the technology has overtones of both Optical Character Recognition and handwriting recognition, it's really neither, says Cooper. "Technically there's some overlap," he explains, "but they're really different technologies. Even if you look at OCR versus the kind of technology you're seeing in pen computers, those are different technologies. OCR is based on something that isn't moving, while pen computing is based on something that is moving. Technically, we're closer to the OCR technology, but the kinds of things we're doing are actually quite different from the kinds of things that are going on in most OCR systems."

Ware elaborates: "This is a pen computing interface, because to the user it looks the same. People will communicate and compute using a pen and checking and making marks. How you do it, how you implement it, underneath the technology is completely different."

Current customers include UNICEF, which also worked with Xerox to develop the product. UNICEF's operations require it to send



The Store Form tells PaperWorks to store an incoming fax in a designated area of your hard disk.

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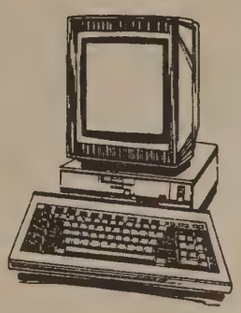

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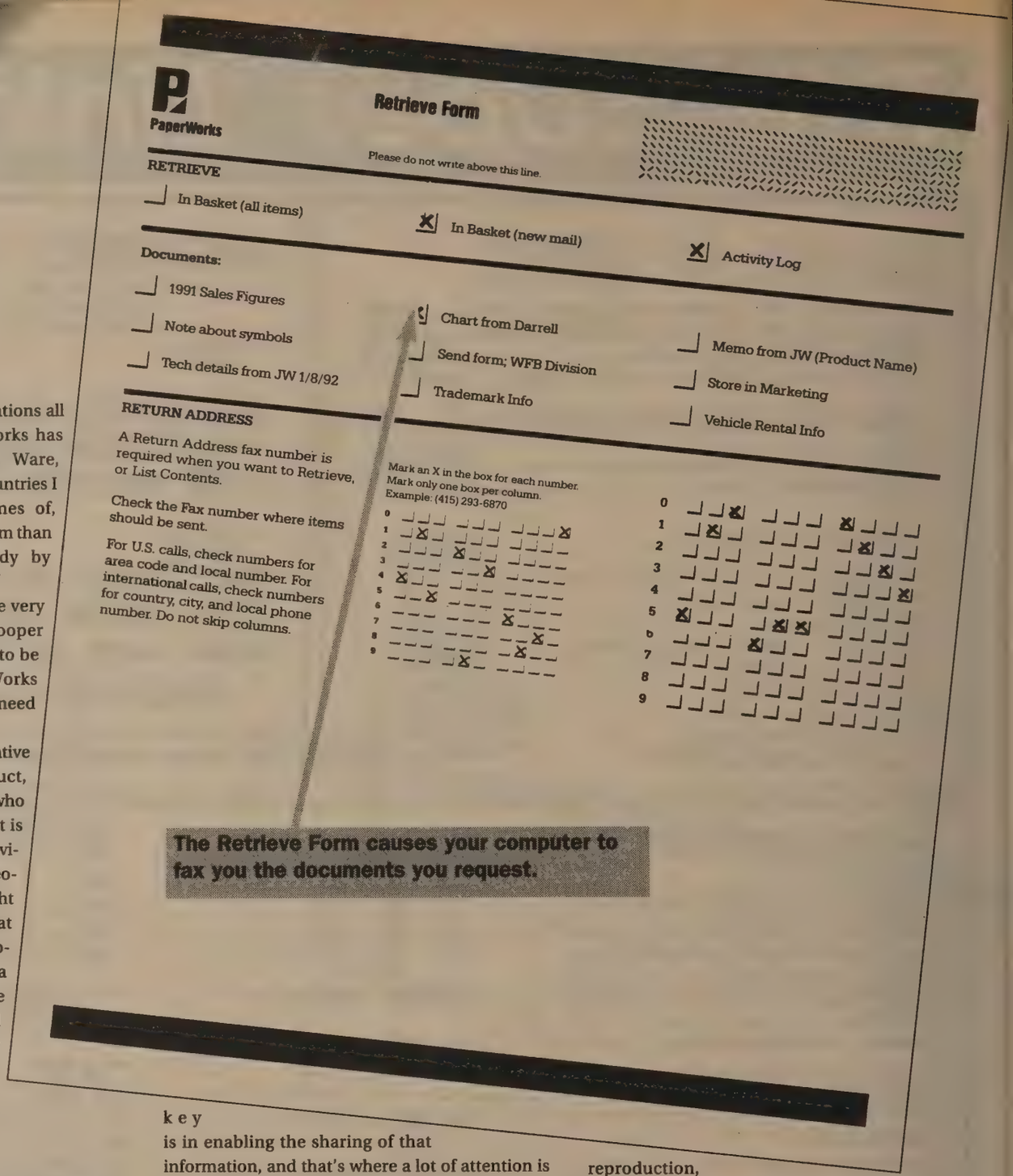
PaperWorks

Retrieve Form

Please do not write above this line.

RETRIEVE

☐ In Basket (all items)

☒ In Basket (new mail)

☒ Activity Log

Documents:

☐ 1991 Sales Figures

☐ Note about symbols

☐ Tech details from JW 1/8/92

☒ Chart from Darrell

☐ Send form; WFB Division

☐ Trademark Info

☐ Memo from JW (Product Name)

☐ Store in Marketing

☐ Vehicle Rental Info

RETURN ADDRESS

A Return Address fax number is required when you want to Retrieve, or List Contents.

Check the Fax number where items should be sent.

For U.S. calls, check numbers for area code and local number. For international calls, check numbers for country, city, and local phone number. Do not skip columns.

Mark an X in the box for each number.
Mark only one box per column.
Example: (415) 293-6870

The Retrieve Form causes your computer to fax you the documents you request.

thousands of faxes per day to locations all around the world, and PaperWorks has proved a valuable tool. Says Ware, "UNICEF uses fax machines in countries I can't even pronounce the names of, because fax is more reliable for them than even trying to reach somebody by phone."

Mortgage brokers, she says, are very fond of the product. And, as Cooper points out, you don't even need to be computer literate to use PaperWorks from remote locations—you just need to be able to fill out a form.

He explains, "There's an alternative view of PaperWorks as a product, where the user is not the person who has the PC. And in that context, it is usable and useful in the kind of environment where you have many people using it. For instance, you might have a sales force on the road that might need to access the most up-to-date price sheets that are on a single PC. All those people are users, but they're certainly not all sitting at the PC using it. They needn't know anything about the PC to use the product."

The Future

PaperWorks is currently in its infancy. Its only version requires a 386SX, 386, 486SX or 486 running Windows 3.x, though Ware says they're looking at the possibility of Macintosh and UNIX versions. It currently supports only four fax cards, admittedly industry leaders: Intel SatisFAXtion, the Complete Fax, the Complete Communicator, and CEI pro-FAX. It will transmit PostScript files, as well as files generated by Excel, Word, and WordPerfect.

But aside from the obvious fact that more platforms and application/device support are sure to appear, PaperWorks is the first in a series of products designed to take advantage of Xerox's technology for document handling.

What's a document? This has been an ongoing subject of discussion at PARC, says Cooper. "Someone could bring in a slab of rock that came off a wall with a cave painting on it, and that's a document. How are you going to transmit it?

"You can conceive of almost anything that has information on it or in it as being a document. The key is in enabling the sharing of that information, and that's where a lot of attention is going. Because the more people try to share, the more they need standards."

And so, while they're reticent about discussing unannounced products, there are some obvious directions, one of which has to do with storing information from the analog world in digitally useful form. Xerox is, for instance, a leader in Optical Character Recognition technology, and it's a reasonable assumption that someday you'll be able to do more with PaperWorks documents than just fax them or read them.

Says Ricci: "PARC has developed some truly remarkable technology. Transparency really does provide the capability of people using documents in much more productive ways, getting a lot more power out of them, using this notion of paper as a transparent interface to underlying computation. The charter of this division is to build products and capabilities using this technology that provides these more powerful services.

"In a world of digital platforms and digital reproduction, fax machines, personal computers—you'd like to be able to move documents around in a very seamless way across that membrane, the digital network. What we want to do is build products that let you move documents across any platform in very simple ways, such as between your fax and your PC. When you have this paper interface to fax machines, you can think of each fax machine as a sort of entry port to your computing world, wherever it is. And Xerox sells lots of these document machines, which one can think of as providing that kind of capability as well.

"We are working with PARC on some of the ongoing technologies in our next generation of products now. There's a very close relationship. We have people working with PARC people, and I expect that to continue.

"If you really think about using paper as a user interface, it's very transparent. It doesn't impose itself. So the particular application and some of the marketing for PaperWorks is oriented towards

continued on page 266

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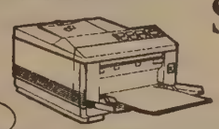

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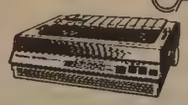

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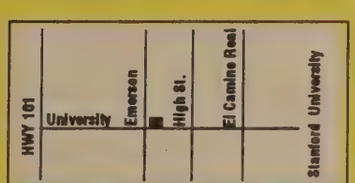

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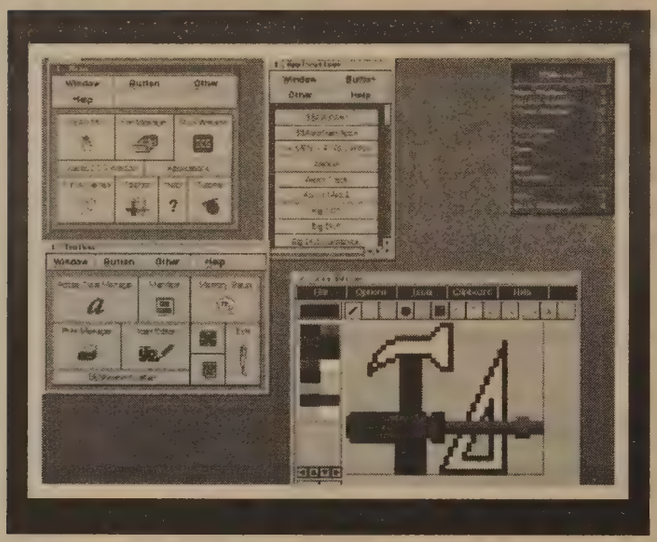
What's New In DESQview/X?

Quarterdeck's enhanced Graphic-Based Multitasker is a revolutionary product for connecting MS-DOS and UNIX X Windows Platforms.Single-platform users may like it, too.

BY LENNY BAILES

DESQview/X is a new wrinkle on Quarterdeck's standard multitasking workhorse. Add a graphic interface and remote network features to the DESQview multitasking engine, and the result is a formidible package. DESQview/X can link MS-DOS and UNIX computing platforms, allowing DOS applications, Microsoft Windows, and UNIX X Windows applications to appear side-by-side on either a DOS - or a UNIX-based machine.



X Windows is a graphic standard that has traditionally permitted UNIX-based platforms to run programs in a mouse-driven, multi-windowed environment. DESQview/X incorporates Quarterdeck's version of the X Server/X Client protocol. Ordinary MS-DOS and Windows applications are converted by DESQview/X into "X Client" applications. (An "X Server" is an X Windows system program that controls a computer's display screen. An X Client is an application—e.g., word processor, drawing program, database—that communicates with a computer through an X Server.)

DOS applications converted into X Clients can run remotely on other DESQview/X PCs, or be accessed on DEC and Sun workstations equipped with a suitable X Windows front end. Conversely, UNIX-based X Windows programs can be transmitted remotely to 80386/80486 PCs running MS-DOS and DESQview/X. (Quarterdeck is also working on an 80286 version of DESQview/X that has not yet been released.)

The combination of the X Window protocol and multitasking engine on MS-DOS machines revolutionizes the options available to managers of mixed DOS-UNIX networks. Formerly, to run DOS programs on a UNIX machine, you needed an expensive emulation program or a "dumb terminal" connection to the PC. Using the PC as an "X terminal" completely monopolized the DOS-based machine, preventing it from doing any other work.

DESQview/X changes all that by allowing both the client and server machines to multitask and remain operable. Even simple file link and transfer utilities between UNIX and DOS machines formerly cost upward of $700. DESQview/X allows convenient file sharing over Novell (IPX), NETBIOS, and TCP/IP-based networks for a third of that.

Remote multitasking can be a great boon for networked sites with one or two powerful servers and a bunch of lower-powered workstations. The machines with less memory and storage space can access and run programs from the higher-powered machines. A 16MHz 386SX can zip through a spreadsheet recalculation or access a wire-frame design program located on an 80486 PC or Sun station. The programs appear side-by-side on the screen with local applications. The lower-powered machine may have only 4MB of RAM and 40MB of hard disk space, but it can effectively borrow the higher-speed CPU and greater storage space of another machine.

ABOUT THE GUI

The default DESQview/X interface takes its look and feel from X Windows front ends like Motif and Open Look. Users of Geoworks Ensemble may also be familiar with this visually attractive and streamlined approach to graphic interfaces. The DVX Application Manager and File Manager permit icon-based program launching and tree-structured file management much like Microsoft Windows. Alternatively, you have access to the traditional pop-up text menu familiar to users of classic DESQview.

DVX's Application Manager can be customized to set up a series of group windows with individual application buttons. Over 100 icons are included in the package, along with an icon editor that lets you roll your own. Buttons can be configured as text-only, icons-plus-text, or icon-only. The Application Manager can duplicate the traditional pop-up text menu, or contain only the items you plan to use frequently. Groups may be configured to spawn nested group and program windows.

Figure 1 shows three different ways to access programs under DESQview/X. You can click on icons, open up a special program list, or use the standard pop-up menu. (The DVX icon editor is also shown in Figure 1.)

The DVX File Manager is a tree-based shell similar to the File Manager in Microsoft Windows. DESQview/X supports file transfers using the FTP (File Transport Protocol). FTP allows files to be exchanged between systems with different operating systems and different hierarchical file structures. (Because FTP supports multiple operating systems, the File Manager is somewhat limited in bells and whistles. There are no copy and format dis-

DESQview/X allows convenient file sharing over Novell, NETBIOS, and TCP/IP-based networks for a third of the cost.

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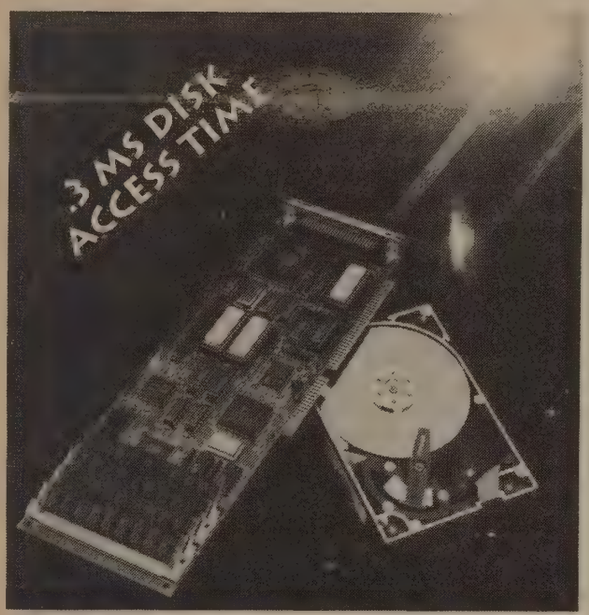

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kette features, and you can't start programs by double-clicking, but you can view files in either ASCII or hexadecimal format.)

DESQview/X makes it easy to connect to other machines on a network. You don't have to load server software or be logged into a server. DESQview/X recognizes other DESQview/X machines as long as the low-level network transport software is active.

DESQview/X Tips And Tricks

1. Remember, you don't need to load your server software on PCs that connect to each other through DESQview/X. Configuring the machines as "workstations only" may salvage an additional 30–50K of conventional memory for application windows.
2. You can make DESQview/X start up applications automatically by entering their names on the line marked "Client" in the DVX.CFG file.
3. If the default font looks too small at 1024x768, you can tell DVX to use a larger one. Run the Advanced Setup program, and under Window Manager, Text Font, try entering pc8x16.snf instead of the pre-configured pc6x13.snf.

During setup, you specify the network type, choose a host name and provide a list of users. Several degrees of security can be implemented. With or without a password, users may be granted file access privileges, the right to run remote programs on the host, or the ability to send programs to a specified host. (You can tell a program at your end to pop up on someone else's machine, or request a remote program to display on your own screen.)

For this article, I tested DV-X on two MS-DOS machines connected by LANtastic, a NETBIOS-based network. Since I didn't have to load the server software, an annoying conflict with classic DESQview on LANtastic servers was neatly eliminated.

Figure 2 shows DESQview/X multitasking on a 386 with the minimum of 4MB of required RAM. The memory on this 386 is quickly exhausted by running Microsoft Windows locally, but you can see another copy of Windows plus several more applications up and running on the screen. The additional programs run remotely from a linked 486 machine with 10MB of RAM. (Note that you can run multiple copies of Windows, as long as each originates on a different host.)

DESQview/X can run DOS text apps, Windows apps, or X Windows apps remotely. Graphic-based DOS applications like Harvard Graphics or Xerox's GEM Ventura Publisher don't run across the network. You can use them locally in full-screen windows, minus the benefits of the DVX clipboard and macro facility. The DESQview/X Mark and Transfer feature has been upgraded to provide "smart pasting" of numerical data into spreadsheets. The clipboard can also be used to transfer text into graphic X Windows applications. (At present, no support exists for cutting and pasting bitmapped or vector graphics.)

Because DESQview/X includes a bundled version of Adobe's Type Manager, you can open "scalable" windows for DOS text applications. No matter how you resize the window, you see an appropriately adjusted eighty-column by twenty-five-row text display. This feature is somewhat more flexible than the three or four "fixed-font" sizes offered in Microsoft Windows. X Windows applications that are aware of Type Manager can use the Adobe fonts for printing as well as screen display. DESQview/X also includes a print manager/spooler to regulate output from DOS and X Windows applications.

If you already have a version of classic DESQview on your machine, DVX detects it during setup and transfers your program menu configuration to the newer product. DESQview/X is bundled with version 6.03 of QEMM, Quarterdeck's 386 memory manager. (QEMM must be installed for DESQview/X to work correctly.) Minimum hardware requirements are an 80386SX or higher PC with EGA or VGA display, a minimum of 10MB of hard disk space, and 4MB of RAM. (One good yardstick for memory is to add about 2MB to whatever total satisfies you with the text-based DESQview—6MB is a good practical minimum.)

HOW DOES IT WORK?

Performance of applications under DVX is not quite as brisk as with classic DESQview, but DOS apps run faster than they would under Windows 3.1. Users have a choice of running Microsoft Windows under DVX as a full-screen DOS application or as an X Client in a small window. There is no performance deterioration for full-screen programs, but you'll find a noticeable slowdown in video running Windows as an X - Client. DVX supports SuperVGA video modes 800x600x16 colors, 800x600x256 colors and 1024x768x256 colors with most standard VGA cards. (1MB of onboard video RAM is required to run at 1024x768x256.)

Version 1.02 of DVX still has some problems with Windows 3.1 that need to be worked out. If your available memory drops below a certain threshold while Windows is running as an X Client, its Program Manager may crash, reporting a general protection fault. Word for Windows, v. 2 behaves in a similar fashion. These problems are not evident with the older Windows 3.0, and Quarterdeck is working on a fix. (You can run Windows 3.1 as a local full-screen application without mishap.)

The DESQview/X Application Manager is a pleasure to use. It is attractive, flexible, and equipped with all the icons you need. The File Manager is adequate, but like most graphic-based shells, forces you to use the mouse too much and click on too many menus to accomplish routine command-line functions. I would have preferred File Manager to be text-based, rather than graphic-based, so that the scalable font feature could fit it into a convenient small-screen window.

SHOULD YOU UPGRADE FROM CLASSIC DESQVIEW?

Quarterdeck does not intend DESQview/X to

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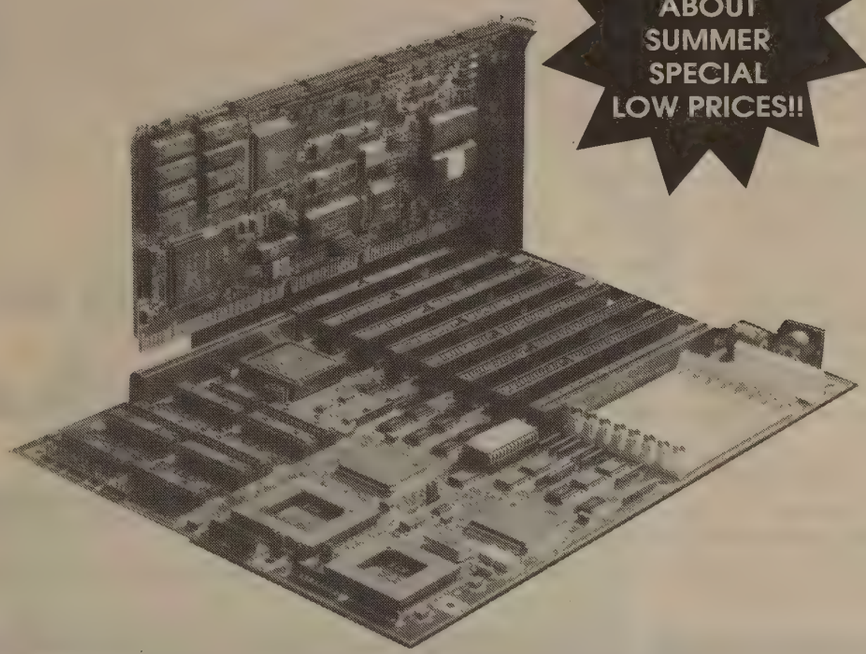

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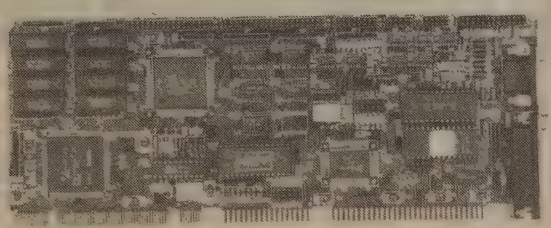

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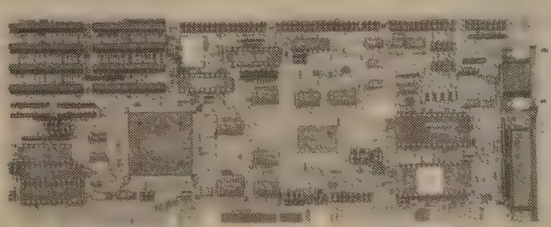

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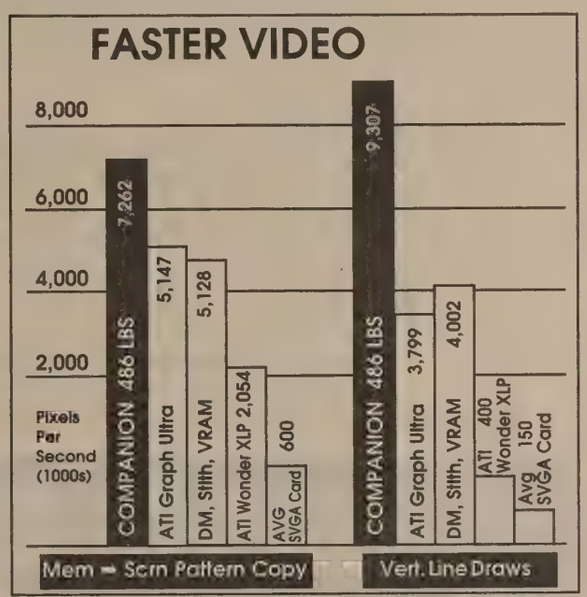

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be a replacement upgrade for its classic DESQview multitasker. DESQview/X has both advantages and disadvantages for a single-platform user.

The most obvious plus is the ability to display scaled program windows at SuperVGA screen resolution. This allows you to monitor many more applications on the screen simultaneously. With some limitations, DESQview/X has classic DESQview's ability to multitask all DOS applications well.

Some "regular" DESQview features are missing in the new package. As discussed above, ordinary DOS graphics applications don't run in "virtualized" small-screen windows. You can't adjust DVX's CPU timeslice ratio on the fly, nor can you configure applications to save CPU time and memory by running "foreground only." DESQview/X does not "put away" programs and swap them to disk. DVX's "Learn" macros and Mark and Transfer feature don't work with "ill-behaved" text programs or with DOS graphics applications that run in full-screen windows.

The new package requires EGA as a minimum graphics standard, where classic DESQview runs comfortably with monochrome, CGA or Hercules graphics. DVX also takes up 8–10MB of hard disk space compared with classic DESQview's modest 1–2MB storage requirement.

On the other hand, DESQview/X offers accessible, intuitive online help and window management, as well as several great games. (The package includes Tetris and a version of Blaqjack designed to run on a network.) The traditional pop-up DESQ menu can now be customized in a standard text editor. You can add nested program subgroups, or place internal DESQview commands anywhere on the menu. The order of listed programs can be reshuffled easily through internal menu options.

Registered users of other Quarterdeck products can upgrade to DESQview/X for $100. Alternative window managers OSF/Motif and Open Look can be purchased separately for $250 and $200, respectively. The basic DESQview/X package includes built-in support for established IPX/SPX or NETBIOS networks. To connect to UNIX X Windows machines, you need a separate TCP/IP network package that Quarterdeck sells for an additional $200. (DESQview/X, v. 1.02 from Quarterdeck Office Systems, 150 Pico Blvd., Santa Monica, CA 90405. 310/392-9851) ■

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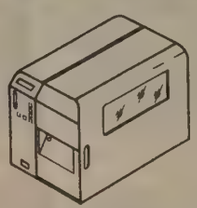

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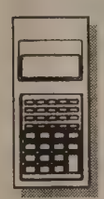

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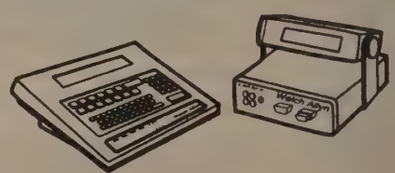

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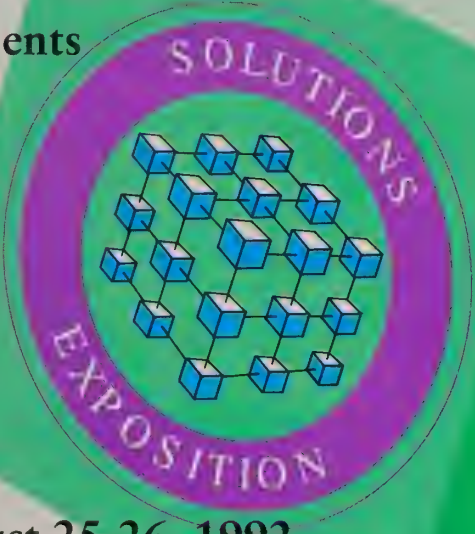

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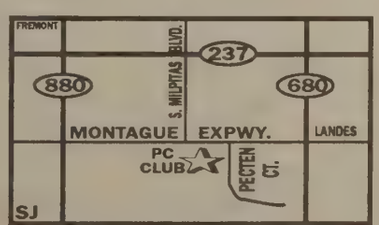

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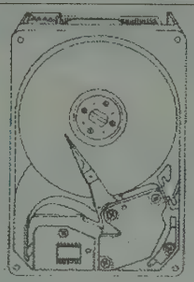

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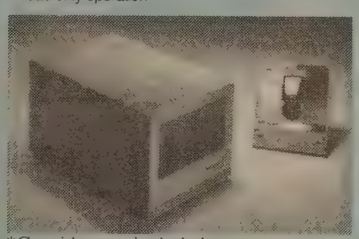

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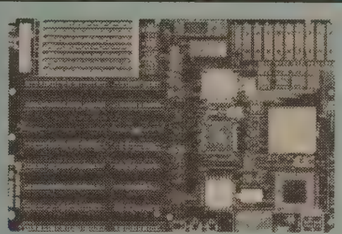

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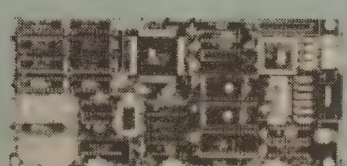

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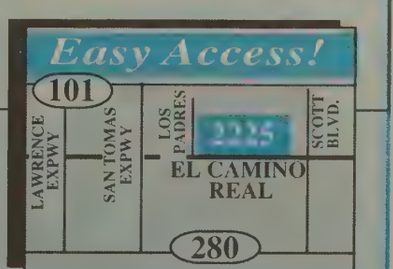

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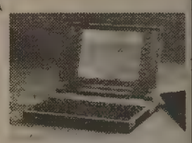

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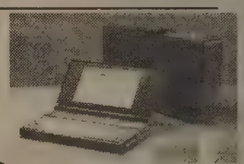

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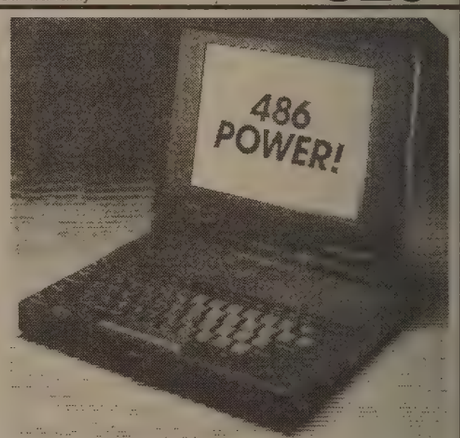

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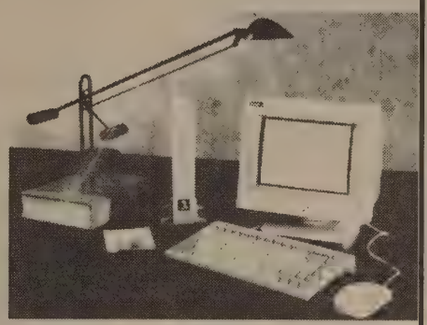

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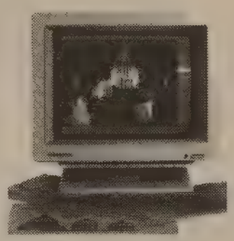

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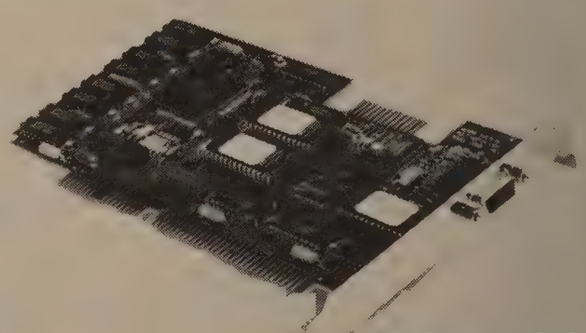

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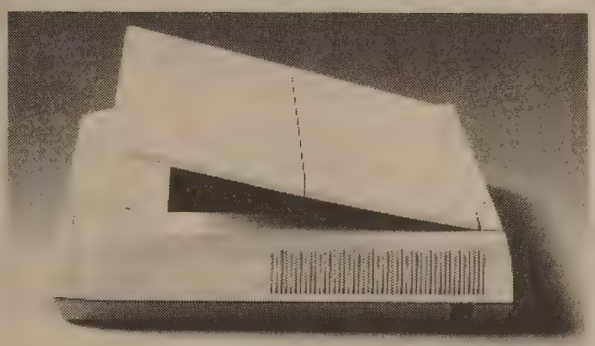

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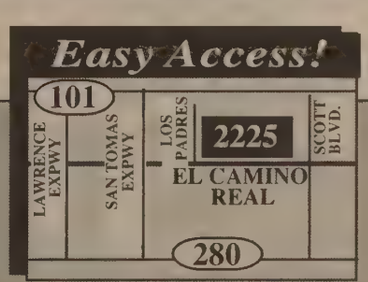

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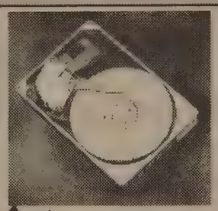

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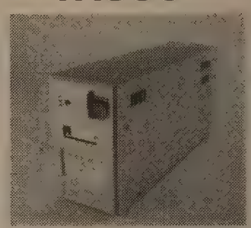

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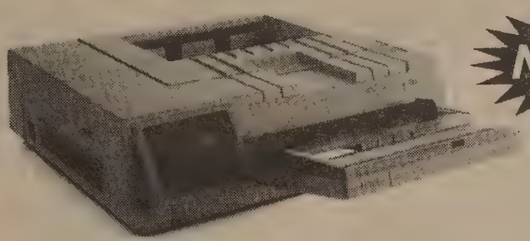

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Internal $309	Internal $329
External 349	External 369

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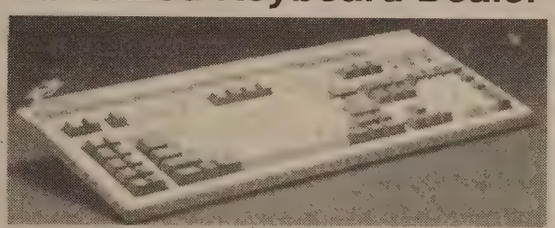

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Also Available for PS/2, AT&T & Tandy

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ESC/P 2™

LQ-1070

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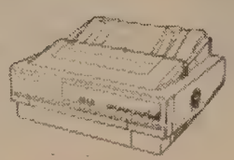

- 24-pin, 315cps
- 12 built-in fonts
- 2 year warranty

$389

- 24-pin, 315cps
- **WIDE Carriage**
- 2 year warranty

Action Printer AP-3250 24-Pin

Ideal for home use! Easy Operation

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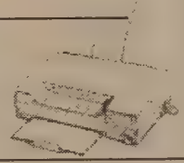

- 200cps, 360x360
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13 Scalable fonts!
Printer Sharing!

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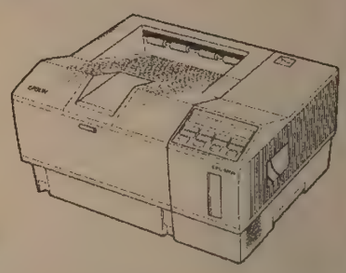

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10ppm!

- 10 ppm, **1MB RAM** exp. to 7.5
- PCL-5, 13 scalable fonts
- Includes RITech for crisper, sharper images
- **Built-In printer sharing**
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LQ-1170	$599
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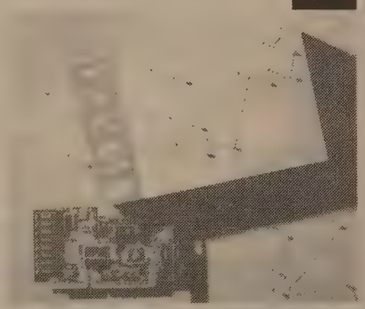
High resolution VGA designed for fast Windows performance!



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- Up to 256 on-screen colors
- Flicker-free refresh rates up to 76Hz
- 1MB memory configurations
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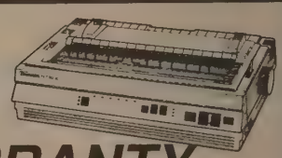

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- 300cps, 100cps LQ
- 8 built-in fonts
- 360x360 dpi
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Wide Carriage Letter Quality!

- WIDE CARRIAGE
- 24-pin, 12K buffer
- 192cps, 63 cps LQ
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- WIDE CARRIAGE
- 9-pin, 16K buffer
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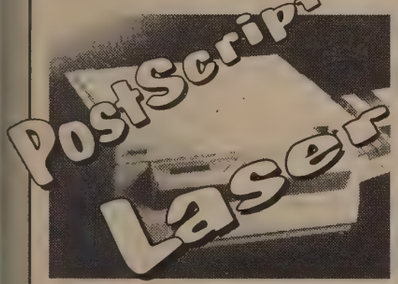

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- 6 ppm, **2.5MB** exp to 4.5MB
- 35 scalable typefaces
- PCL 4 • 1 year limited warranty
- Optional font cartridge support

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IIP*Plus*	4ppm, PCL-4	799
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III	8ppm, scalable fonts	1450
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It doesn't Scream, ... it whispers.

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- 24-pin letter quality
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2100 Series Color Option Available $49.95

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- 24-pin letter quality
- 320cps, 85cps LQ
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- 2 year warranty

$339

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- 9-pin matrix
- 192cps, 38cps NLQ
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*FREE Adobe Type Manager! W/ Purchase of 2624, 2124, 2123, & 2624

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- 24-pin letter quality
- 300cps, 100cps LQ
- 11 fonts, 26K buffer
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KX-P4455 PostScript Laser

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Accessories for 4455/4450i	
Legal Tray	$49
Envelope Tray	69
Toner	39
Drum Unit	149
Developer	99

- 2MB RAM exp to 4MB
- Two 250 sheet paper trays
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POSTSCRIPT

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NEW!

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Scalable Fonts!

- 1MB RAM exp to 5MB
- **PCL-5 Scalable**
- 300 dpi resolution • 5 PPM
- 200 sheet paper capacity

KX-P4410 Laser Printer

*FREE Adobe Type Manager!

5ppm!

***$599.95**

- 512K RAM exp to 4.5MB
- 200 sheet paper capacity
- 300 dpi resolution • 5 PPM

DOT MATRIX

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KX-P1123	197
KX-P1124i	289
KX-P1695	$348
KX-P1624	348
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9600bps Modem/9600 Fax
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- *Eliminate junk faxes*
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TEFAX Computer Interface Fax Machine For PC & Mac*

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- Extended keypad for multiple dialing features
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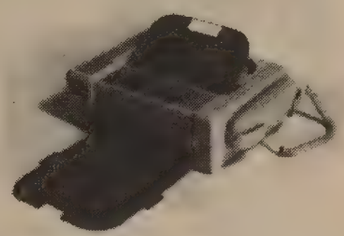

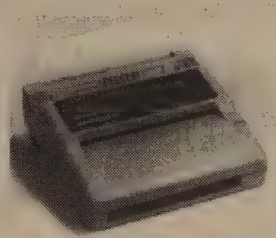

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- Fast **14** second transmission speed
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- 10-page document feeder
- Broadcasting capability
- Optional AutoFax® software for Windows....$109

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*Optional software package available for PC & Mac

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PC500 Flip-Phone

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- 30# memory
- 75 minute talk
- 20 Hour standby
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PC900 Flip-Phone

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- 100# Alpha memory
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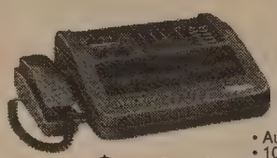
The Desktop Business Fax... With Automatic Paper Cutter



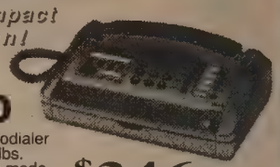
M1500

$496

- Auto paper cutter
- 10-page auto doc feeder
- 16-level grayscale
- Stores up to 20 numbers -10 one-touch, 10 speed-dial
- Prints conformation reports

Fax, Phone & Copier For the Home

UltraCompact Design!



M750

- 20-number autodialer
- Weights 5 1/2 lbs.
- Fine resolution mode
- Built-in, pre-recorded "voice-on-chip" prompt

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A Full-Featured Fax Able to be Connected to your PC

Allows transmission & reception of computer info through the fax machine.

F-38

- Auto paper cutter
- 16-page CCITT memory
- 10-page auto doc feeder
- 16-level grayscale
- Stores up to 70 numbers -20 one-touch, 50 speed-dial
- Polling, real-time or delayed
- Computer interface capabilitites, RS232 port
- **Otional computer software kit available**

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Quality *IMAGE-MATE* Fax Paper by Murata

2 ROLL 49' PK $6.99

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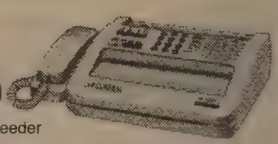
The Efficient Business Fax ...With Practical Fax Features



M1000

- 10-page auto doc feeder
- 16-level grayscale
- Stores up to 20 numbers -10 one-touch, 10 speed-dial
- Prints conformation reports

$436

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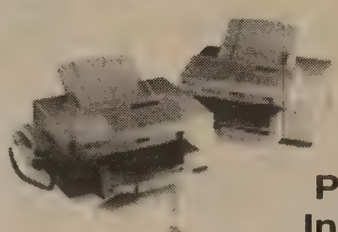
Plain Paper Faxes at Affordable Prices.



Plain Paper InkJet Faxes

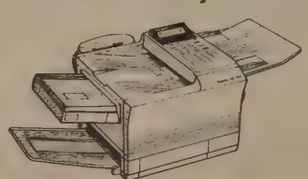
- 20-page feeder • InkJet printing technology
- 100-page paper capacity • Delayed dialing
- Broadcasting function • Error Correction Mode

200 32-level grayscale, 12-page memory $998

310 32-level grayscale, 512K exp. to 2MB ... $1299

Curling Up Is Hard To Do!

Plain Paper Laser Fax with Convenient Memory Functions



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UF-733

- Crisp clear laser technology
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Plain Paper InkJet Fax that handles multiple jobs at a great price

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UF-312

- High resolution 300dpi copy quality
- Simultaneous multi-functions
- 28-page memory
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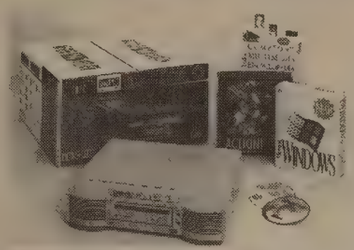
This highest performance, 16-bit multimedia upgrade system currently on the market. It comes with the Pro AudioSpectrum 16 sound board and a high performance, dual-speed NEC SCSI CD-ROM drive. **$999**

Pro AudioSpectrum Plus
Media Vision's high fidelity, stereo sound board for IBM PC and compatibles. Fully compatible with AdLib, Sound Blaster and Windows 3.1 applications. **$199**

Pro AudioSpectrum 16
Media Vision's "true 16-bit," high fidelity, stereo sound board for IBM PC and compatibles. Fully compatible with AdLib, Sound Blaster and Windows 3.1 applications. **$229**



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Media Vision's innovative "one-step" MPC Upgrade subsystem. This external system includes the ***Pro AudioSpectrum 16*** sound technology, a Sony CD-ROM drive, internal speakers with 100 watts of power and an optional external Bass Enchancement System (sub-woofer). **$1049**

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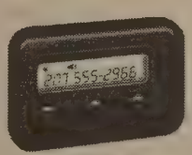

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Multi-scanning Super VGA Monitor

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  Maximum resolution at interlaced mode
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  0.28mm dot pitch & non-glare CRT for greater clarity
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  For comfortable viewing position!
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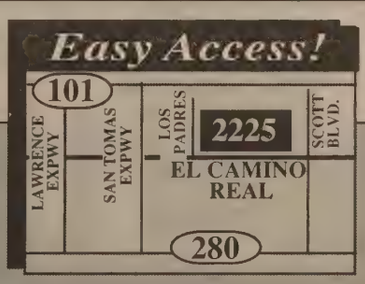

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Ethernet capability with built-in EtherTalk, TCP/IP & Novell

Image Enhancement Technology
Smooths curves, sharpens corners & enhances gray scales!

Automatic Recognition Technology
Makes printer sharing between Mac & IBM a snap!

TurboPS/400p™

$1840

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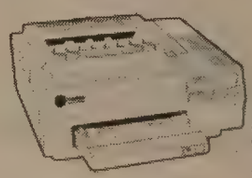
- AppleTalk, Parallel, Serial & SCSI ports standard.
- 4MB Memory standard-expandable to 16MB
- Fast RISC printing

TurboPS/660™

Announcing The New TurboPS/660™ Printer!



$2760

- High Resolution **600x600** dpi standard w/IET
- PostScript, HP LaserJet II & HPGL emulations.
- AppleTalk, Parallel, Serial & SCSI ports standard.
- 6MB Memory standard-expandable to 32MB
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- Fast RISC printing

Announcing The New Gray Scale Printer!

TurboPS/880™

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Small / Fast
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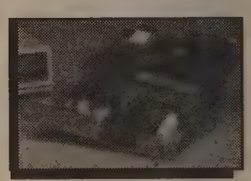
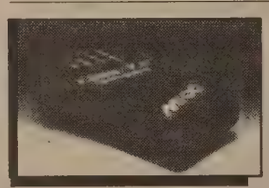
MNP 5 & V.42bis in HARDWARE
Group III / Class 1 & 2

PC Internal 1/2 Card - Triple 96 Fax/Data Modem*
9600 Send/Receive Fax
2400 V.22bis Data

$269

5" x 2-3/4" External Pocket Sized Version $299





Pocket Sized - Triple 144 Fax/Data Modem*
5" x 2-3/4" - Runs on 9V Battery
14.4Kbps Send/Receive Fax
14.4Kbps V.32bis Data
AC Adapter Included

$429

External Fax/Data Modem - Triple 144*
14.4Kbps Send/Receive Fax
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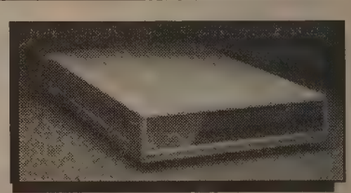

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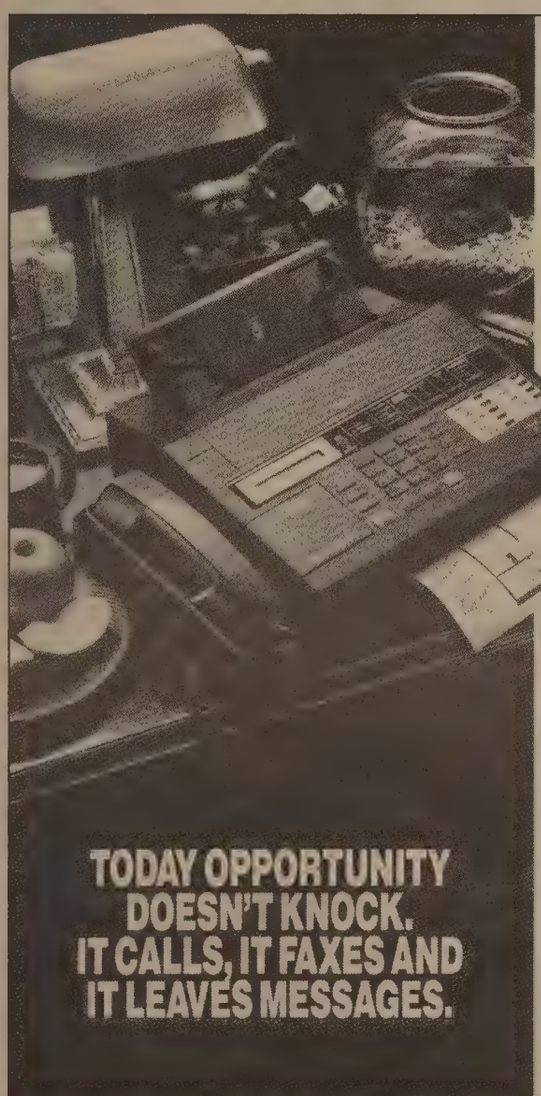

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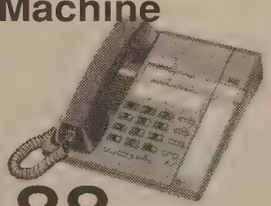

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Three Computers In One

The Amiga Multiplatform Solution

On a 14 MHz Amiga, Macintosh software runs roughly three times faster than on a stock Macintosh Plus or Mac Classic.

BY RICH GRACE

The Amiga's been out for some years now, and has been considered a "niche" machine by most users, who tend to identify it with games and desktop video.

However, one generally unnoticed aspect of this machine is its unique multiple platform capability. The Amiga is the only machine to successfully implement the capabilities of the top three consumer microcomputers in the market—PC, Mac, and Amiga—all in one box. In this article, we'll explore how this is done, and the products that make it possible.

To begin with, let's examine the hardware. Our multiplatform system is an Amiga 2000 CPU with the following enhancements:

Amiga Side
- AmigaDOS 2.04 ROM upgrade
- AdSpeed 14 Mhz 68000
- 9 MB RAM
- 1.0 GB Micropolis Hard Disk
- 600 MB TEAC Serpentine tape drive
- Seiko CM1450 Multisync Monitor
- MicroWay Flicker Fixer video card

PC Side
- Commodore 80286 BridgeCard with 1MB RAM
- Plus Development 105MB HardCard
- Sigma 512K VGA Card
- Dual Serial/Parallel Ports

Macintosh Side
- AMAX II Plus Macintosh Emulator
- Macintosh Plus ROMS
- Macintosh External Floppy Drive

This machine is in use at Wright Engineering in Huntington Beach, a small software engineering firm I'm affiliated with. It has just released a shareware product called GDraw for the PC, largely created on this Amiga platform.

THE AMIGA/MAC INTERFACE

Leaving the legal controversy of cloning Macs aside, the Amiga/Mac interface consists of a very simple setup: a set of Apple Mac Plus ROMs obtained from a reseller, and a module called AMAX II Plus.

AMAX II Plus is an Amiga 2000 card, which plugs into the Amiga backplane, and provides the ability to run most major Macintosh applications software (our test bed included Microsoft Word 5.0, Aldus PageMaker 4.2, and Adobe Type Manager, plus a selection of fonts). AMAX II Plus lists for $500, which I consider somewhat exorbitant, but the quality of the product does help compensate for its price.

On a 14 MHz Amiga, Macintosh software runs roughly three times faster than on a stock Macintosh Plus or Mac Classic. The processor speed is one factor; another, more important, one is the graphics coprocessor chip set built onto the Amiga motherboard, which AMAX fully supports. With such a system, screen updates are quicker than my Macintosh IIci! Any Amiga processor upgrade will automatically boost the performance of the Mac emulator.

Another felicitous aspect of AMAX is its ability to harness the Amiga SCSI bus to its fullest. Amiga hard disk subsystems can be painlessly allocated for Macintosh partitions. SCSI performance is fully functional, dependent only on the speed of the SCSI controller. We've set aside a 100MB partition on the 1GB Micropolis hard drive, and it works seamlessly. We even use the TEAC tape drive to back up the Mac system.

Memory available on AMAX II Plus is the same as for a Mac Plus, which means you're limited to 4MB regardless of the memory available on the Amiga. It's possible to run System 7 on such a system, but it's not a good idea because of the limited memory addressability, and the overall sluggishness of System 7 on 16-bit systems. It's also not possible to run Mac II ROMS, or software that requires Color QuickDraw or other recent additions to the Mac system. However, if all you need to do is run some of the essential Macintosh applications, and you don't want to spend money on a new system or take up more desktop space, AMAX is an efficient option.

THE AMIGA/PC INTERFACE

The Amiga 2000 and 3000 Tower systems are distinguished by a dual backplane: one backplane on the system board is dedicated to Amiga expansion slots, and another is devoted to standard ISA PC expansion slots (See Fig. 1). The two backplanes are joined by a pair of "bridge" slots that share the PC and Amiga slot architectures. This dual backplane sets the Amigas apart from any other machine in its class, because you can place an Intel processor-based card on it, enabling simultaneous Amiga/PC operations in the same box.

The secret to this dual-platform operation is called the Bridgecard, and it's manufactured exclusively by Commodore. The Bridgecard comes in two flavors: 8088 and 80286 (it's rumored that a 386SX Bridgecard is imminent). The XT bridgecard is barely worth mentioning, and the 80286 Bridgecard runs at a 8 MHz, which is barely adequate for any serious work. (It's possible to place a 386SX accelerator into the 286 socket on the Bridgecard, but we have not done this.) The

continued on page 268

RESOURCES:

Commodore Business Machines
West Chester, PA
Amiga 2000 CPU: List $1195
386SX-20 Bridgecard: List $959
286 Bridgecard: List $499
XT Bridgecard: List $299
(215)431-9100 or 1-800-66-AMIGA

ReadySoft, Inc.
AMAX II Plus: List $500
30 Wertheim Ct., #2
Richmond Hill, Ontario, Canada L4B1B9

Quantum Corp.
Plus HardCard: List $595
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Milpitas, CA 95035
(408)894-4000

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Rich Grace is a Contributing Editor of PC Home Journal, and a contributor to Computer Buying World. He's a technical writer, and an enthusiastic user of PC, Mac, and Amiga platforms. He lives in Orange County, and can be reached on MCI Mail ID 484-6217.

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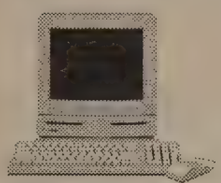

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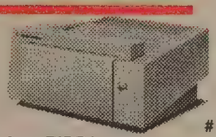

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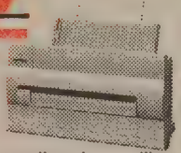

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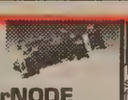

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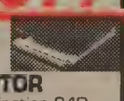

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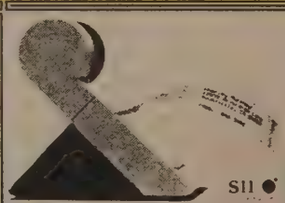

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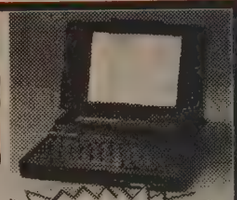

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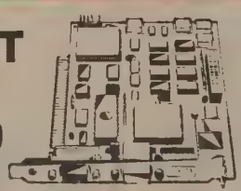

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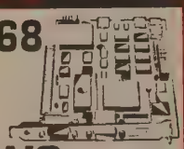

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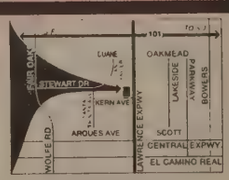

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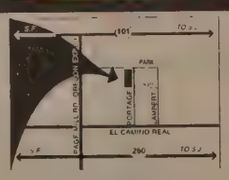

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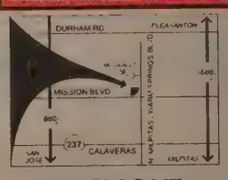

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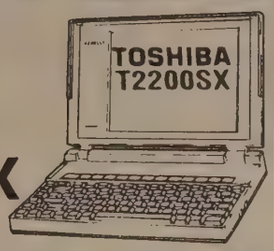

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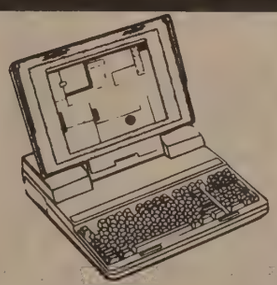

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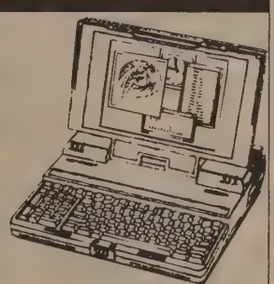

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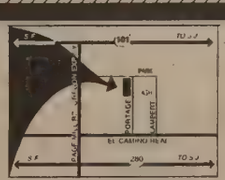

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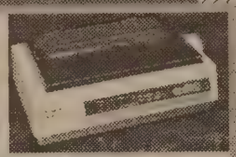

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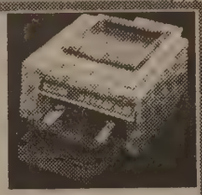

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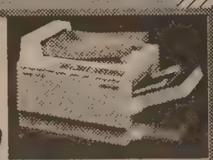

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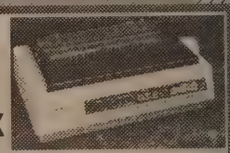

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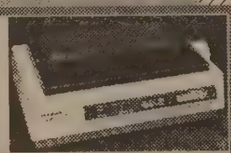

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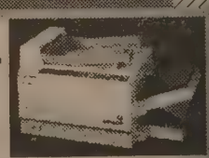

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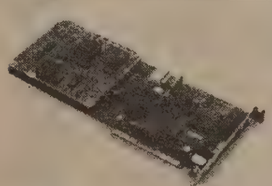

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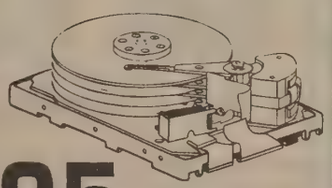

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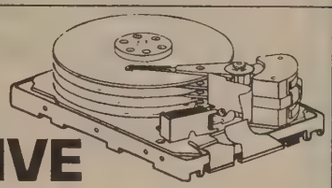

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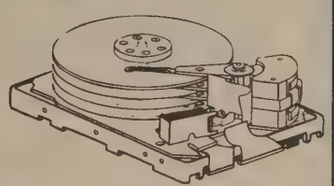

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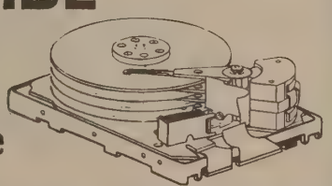

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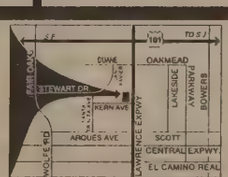

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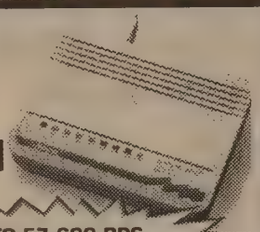

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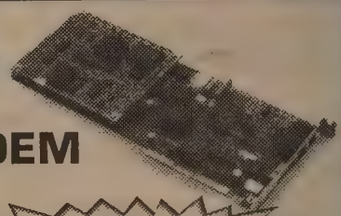

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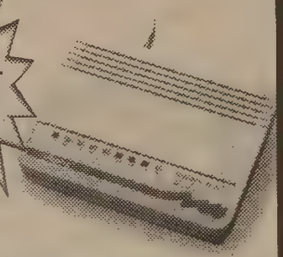

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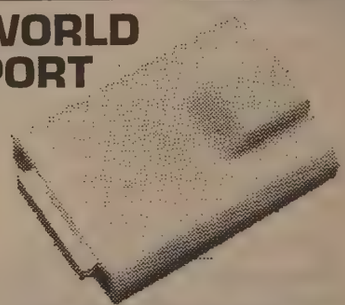

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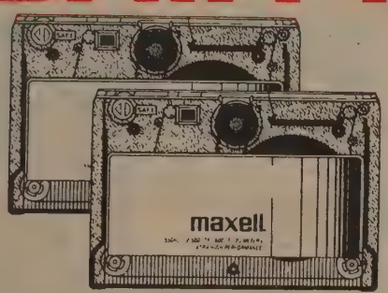

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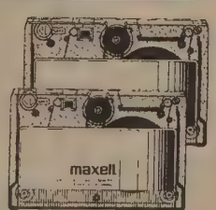

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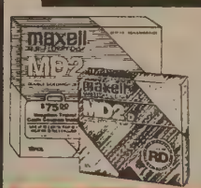

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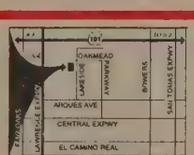

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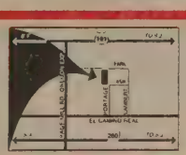

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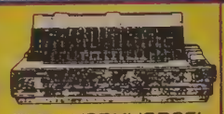

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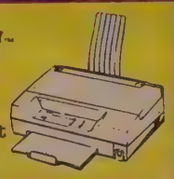

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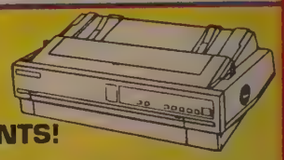

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84 CPS Letter Quality
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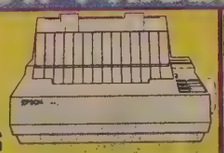

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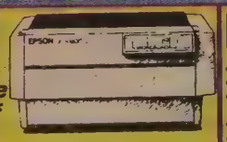

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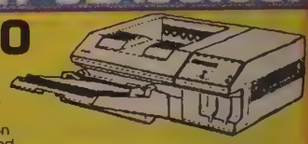

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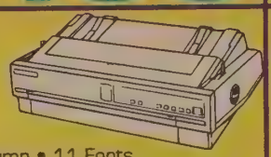

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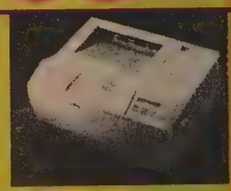

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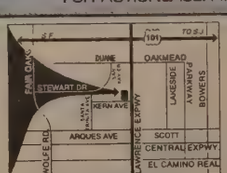

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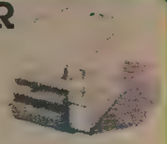
LASER PRINTER 4029-041 10A



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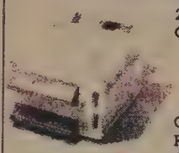

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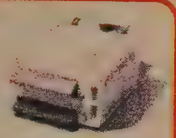

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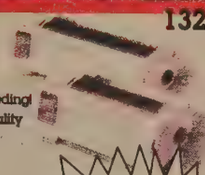

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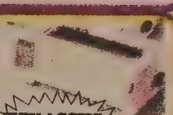

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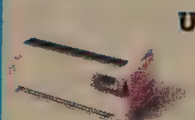

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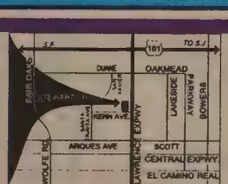

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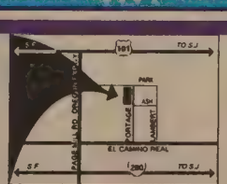

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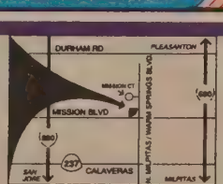

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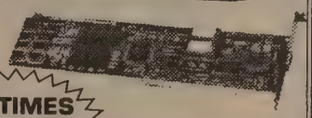

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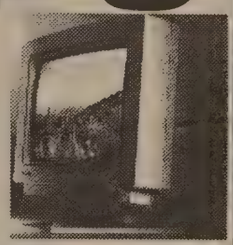

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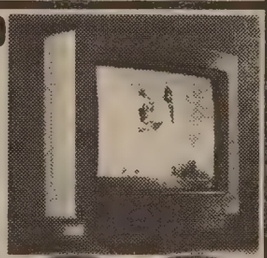

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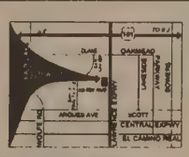

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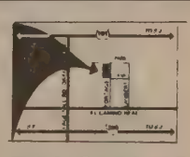

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33MHz 386
213MB SVGA SYSTEM

2MB RAM • 32K Cache
3.5" 1.44MB Floppy Disk Drive
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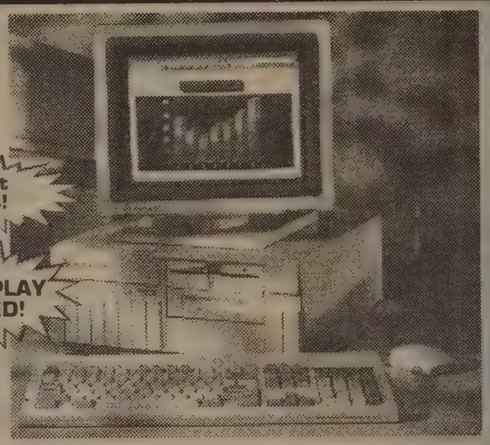
213MB Hard Drive
101-Key Keyboard HRVGA
DOS, Window Works Mouse
#1700550

Microsoft Windows!

SVGA DISPLAY INCLUDED!



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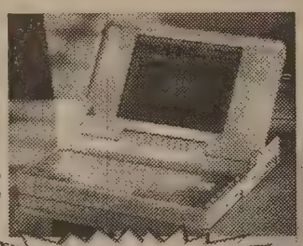

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DOS, Window Works
Fax Modem Prodigy
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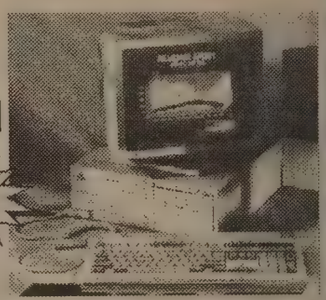

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4MB RAM
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101-Key Keyboard
1024 X 768 .28 SVGA Display
4 16-Bit
Expansion Slots
4 Drive Bays
1 Parallel/2 Serial
Ports
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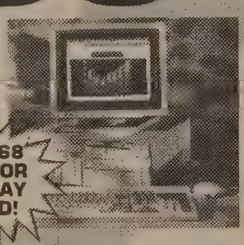

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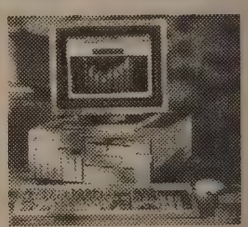

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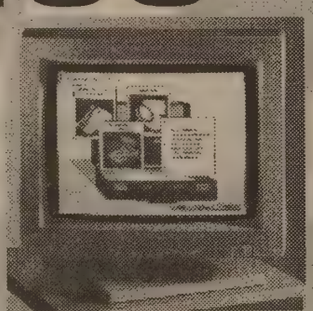

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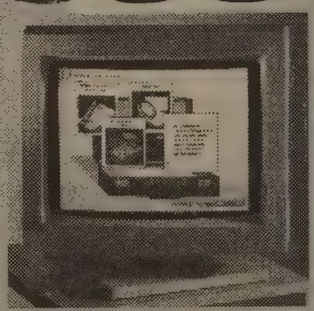

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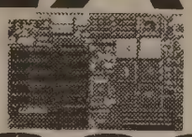
MYLEX 33MHz 386 MOTHERBOARD



386DX 33 33MHz CPU • 64KB of Two Way Cache • Expandable to 125KB • Mylex BIOS, 8 SIMM Sock ØK Expandable to 32MB • Six 16-Bit and One 8-bit ISA BUS Slots, • IDE, FDC, One Parallel Port, Two Serial Ports, 80387 and Weitek 3167 Sockets, SMT Assembly on Baby-AT. Form Factor #1633263

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MYLEX 20MHz 386SX MOTHERBOARD

386SX 20MHz CPU • 64KB of Two Way Cache Expandable to 128K • Mylex BIOS, 8 SIMM Sockets ØK Expandable to 16MB • Six 16-Bit and One 8-bit ISA BUS Slots,IDE, FDC, One Parallel Port, Two Serial Ports, Socket for 80387SX SMT Assembly on Baby-AT. Form Factor #1633252

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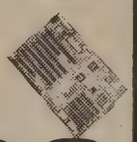

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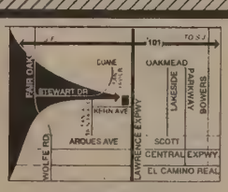

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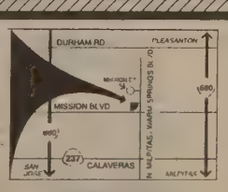

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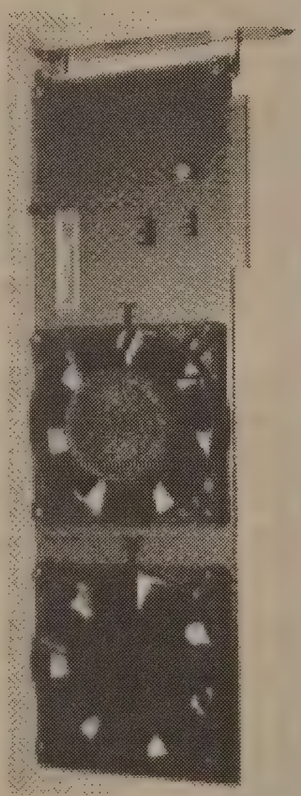

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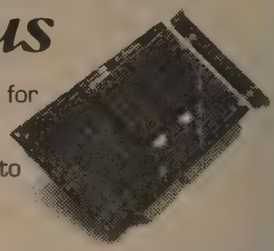

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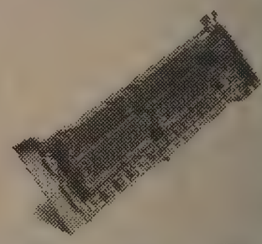

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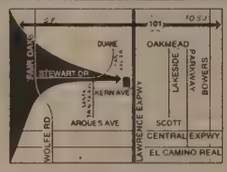

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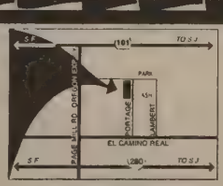

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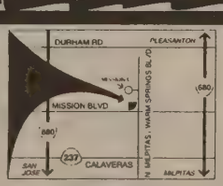

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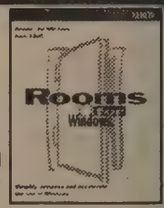

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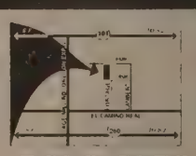

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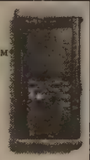

50MHz Scope & Multimeter
LED Display Waveform Memories & Average Min/Max Mode, Plus more

$1495

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LED Display Frequency True RMS Volts Smoothing, Change Alert, Touch Hold, Plus more

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4000 count DMM designed for the automotive market. LO-Ohms, Smoothing, RPM, Duty Cycle w/Dwell Chart.

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0.1% Basic dc Accuracy
20kHz acV
High resolution Analog pointer
True RMS ac
1ms PEAK MIN MAX
4 1/2 digit mode • Back lit display
Three year warranty

VOLTS, OHMS, DIODE TEST, AUDIBLE CONTINUITY, FREQUENCY AND DUTY CYCLE CAPACITANCE, TOUCH HOLD, RELATIVE PROTECTION MODES, HOLSTER WITH FLEX STAND

$298.99

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FLUKE 85 DIGITAL MULTIMETER

0.1% Basic dc Accuracy
20kHz acV
Analog bar graph & zoom
Three year warranty

VOLTS, OHMS, DIODE TEST, AUDIBLE CONTINUITY, FREQUENCY AND DUTY CYCLE CAPACITANCE, TOUCH HOLD, RELATIVE PROTECTION MODES, HOLSTER WITH FLEX STAND

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FLUKE 83 DIGITAL MULTIMETER

0.3% Basic Accuracy
5kHz acV
Analog bar graph & zoom
Three year warranty

VOLTS, OHMS, DIODE TEST, AUDIBLE CONTINUITY, FREQUENCY AND DUTY CYCLE CAPACITANCE, TOUCH HOLD, RELATIVE PROTECTION MODES, HOLSTER WITH FLEX STAND

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3200 COUNT DIGITAL DISPLAY
31 SEGMENT ANALOG BAR GRAPH
0.3% BASIC DC VOLTS ACCURACY
2.0% BASIC AC VOLTS ACCURACY
1.5% BASIC DC VOLTS CURRENT ACCURACY (32mA TO 10A)
0.5% BASIC RESISTANCE ACCURACY • HOLSTER/FLEX-STAND
2000 HOUR BATTERY LIFE (ALKALINE)
AUTOMATIC TOUCH HOLD • DIODE TEST
AUDIBLE CONTINUITY BEEPER • AUTORANGING WITH MANUAL RANGING • SLEEP MODE WITH HARD POINTS
3 YEAR WARRANTY

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FLUKE 75 SERIES II DIGITAL MULTIMETER

3200 COUNT DIGITAL DISPLAY
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0.5% BASIC DC VOLTS ACCURACY
2.0% BASIC AC VOLTS ACCURACY
1.5% BASIC DC VOLTS CURRENT ACCURACY (32mA TO 10A)
0.7% BASIC RESISTANCE ACCURACY • HOLSTER/FLEX-STAND
2000 HOUR BATTERY LIFE (ALKALINE) • DIODE TEST
TL70 TEST LEADS • AUDIBLE CONTINUITY
BEEPERAUTORANGING WITH MANUAL RANGING
SLEEP MODE • 3 YEAR WARRANTY

$138.99

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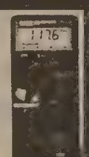
FLUKE 73 SERIES II DIGITAL MULTIMETER



3200 COUNT DIGITAL DISPLAY
31 SEGMENT ANALOG BAR GRAPH
0.7% BASIC DC VOLTS ACCURACY
3.0% BASIC AC VOLTS ACCURACY
2.0% BASIC DC VOLTS CURRENT ACCURACY (32mA TO 10A)
1.0% BASIC RESISTANCE ACCURACY • HOLSTER/FLEX-STAND
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Min Max recording
with relative time stamp
Capacitance: .001 to 9999uF
V Check™ • Continuity Capture™
4000 count digital display
0.9% basic dc volts accuracy
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Fast continuity beeper • Diode Test • Sleep mode
Two year warranty

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FLUKE 11 HANDHELD DIGITAL MULTIMETER

Capacitance: .001 to 9999uF
V Check™ • 4000 count digital display
0.9% basic dc volts accuracy
1.9% basic ac volts accuracy
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Fast continuity beeper • Diode Test
Sleep mode • Two year warranty

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4000 count digital display
1.5% basic dc volts accuracy
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Fast continuity beeper • Diode Test
Sleep mode • Two year warranty

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True RMS AC Clamp Meter.
Analog Digital display.
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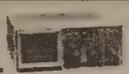

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AUTO/NORM triggered sweep operation with AC TVH TVV and the coupling • x10 magnifier
Bright, sharp rectangular CRT with P3331 phosphor
X-Y operation • Front panel trace rotation control
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BK PRECISION 40 MHz DUAL-TRACE OSCILLOSCOPE

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20 calibrated sweeps
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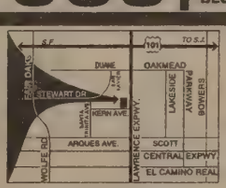

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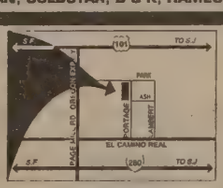

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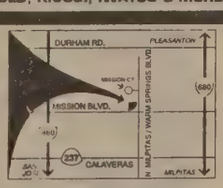

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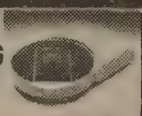
2900 RAM 2M PROGRAMMING SYSTEM



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- Optional MatchBooks provide quick, easy handling of LCC and PLCC surface-mount devices.
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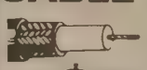

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500 ft
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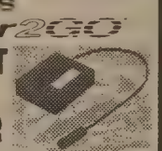

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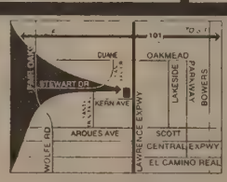

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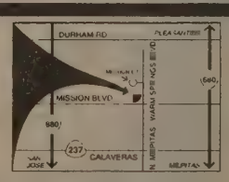

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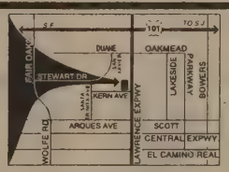

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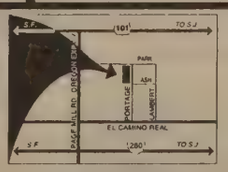

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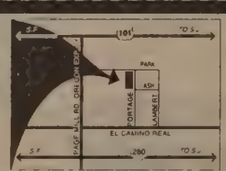

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Choose Your Illusion

As Features Become More Similar, The User Interface Becomes More Fluid

BY PAUL HOFFMAN

Buying software is never easy. You have to make sure that the intended purchase has all of the features you need and doesn't cost too much.

One of the most overlooked aspects of choosing software is its user interface. Most people are feature-conscious, assuming that a full-featured application will have at least an adequate interface. After buying the package that they spent so much time evaluating, they often discover that the software is "hard to learn" or that the commands are "difficult to memorize." In other words, the software has a bad interface.

Ten years ago, many major packages got away with having downright difficult interfaces by offering enough "advanced" features to entice pioneering users to buy them. Some, like 1-2-3 and WordPerfect, became entrenched standards based on their feature sets alone. When there was almost no software anywhere, there was not much to judge against. And even the worst PC software had interfaces as good (and as bad) as the best mainframe software.

If you choose clunky software, it doesn't matter how many features it has—it will be a pain to use.

However, what's OK for pioneers isn't good enough for the average user—certainly not a decade into the PC revolution. If you choose clunky software, it doesn't matter how many features it has—it will be a pain to use.

WHERE'S THE STEERING WHEEL?

A good list of features is somewhat important for software, but most features are underutilized. Half of the features in WordPerfect or 1-2-3 are used by only 20% of all PC users. On the other hand, everyone has to live with the user interface every day. No matter how many or few features you use, if you can't remember where they are or how to access the ones that aren't on the menu (if there even *is* a menu), you are wasting hours over the course of a year looking it up in the manual.

Apple realized this problem when it released the Macintosh in 1984. Let's face it: MacWrite and MacPaint were by no means feature-laden. However, the features they had were incredibly easy to find and remember. No matter how much of a novice the user was (those of us who were the first Mac pioneers remember just exactly how "novice" many of those first users were), he or she could use most of the features within a day or two. While books about PC software proliferated, there wasn't much of a market for Macintosh books because users "got it" sooner.

But user interface is rarely listed among the features in comparative reviews—user interface has always been considered "subjective." The PC software industry has never tried to promulgate any standards for usability. The concept of a "standard user interface" was so repugnant to software companies that few companies were willing to try to crack the Macintosh market because of Apple's enforced interface. Even after the Mac interface got rave reviews from even the most outspoken critics (notably John Dvorak), many people made fun of Apple for restricting the interface.

It wasn't until Microsoft followed the same route as Apple that software writers realized that this might be a good thing. In the year before Microsoft released Windows 3.0 in 1990, many companies struggled with fitting their current interface into the Windows paradigm. Fortunately, the vast majority of them scrapped their old interfaces and bought into the Windows/Macintosh concepts of dialog boxes, menus, a mouse, and standard command keys.

SIMILAR BUT NOT EQUAL

Once the basic software market had matured in the late 1980s, programs differentiated themselves by the number of features they had. There were the "complete" packages on the high end, the "easy" packages on the low end, and the "basic" packages in the middle. There was usually a smooth gradation in price as well. Within a category, the different software usually had approximately the same features but different interfaces.

Word processors are an excellent example of this. The two best-selling non-Windows products are WordPerfect and Microsoft Word. They have about the same number of advanced features like footnotes, style sheets, and macros. However, they have radically different user interfaces. WordPerfect relies almost completely on Control-key and function-key combinations. Word, on the other hand, has pull-down menus and dialog boxes. Even though the latter is often easier to learn and use, and the two programs are almost identical on the feature lists, WordPerfect continues to dominate the market.

The best explanation for this is industry momentum. WordPerfect has always been the industry leader. It had more features than Word early on, and it got a commanding lead before user interface was considered important. Because of this, people who get a recommendation from a friend are likely to hear WordPerfect mentioned much more often than Word. As most training specialists can tell you, however, Word users get further faster than WordPerfect users.

The spreadsheet market is another example of features over interface, but for a different reason. Most spreadsheets look almost identical: rows and columns of boxes that you fill in, with menu choices at the top. Most of this is due to VisiCalc's and then 1-2-3's dominance in the market early on. Since then, many companies have come out with different ways of presenting spreadsheets which could appeal to a wider, less linear audience, but none has done very well.

IF YOU ONLY REMEMBER ONE THING

Now that the Macintosh/Windows interface has become the de facto standard for the PC industry (and much of the rest of the computer industry as well), all software manufacturers must decide whether to keep their nonstandard interfaces or conform to the new standard. Many, of course, are keeping their old interfaces. WordPerfect and 1-2-3 still have basically the same interfaces they have had for a decade. Other companies, however, are changing over.

For example, in the latest release of the Norton Utilities, many of the programs have Windows-like interfaces with menus and dialog boxes. Some of the programs, notably the Disk Doctor, still have their older guess-if-you-can interfaces.

Some programs go so far as to let you customize how the commands are given. Most notable in this area is Borland's Quattro

spreadsheet, which includes many customization features. One of Borland's original motivations was to allow people who remembered 1-2-3's commands and keystrokes to be able to use Quattro without having to learn any new commands. Lotus sued Borland over this, and the case goes to trial this fall. The case is being closely watched because Quattro's native interface does not conflict with 1-2-3's; however, Lotus contends that even allowing (and, to be honest, suggesting) that the customer use the Lotus-like interface infringes on its copyright.

If Lotus loses, you may see many non-Windows programs taking on adoptable interfaces. Many people in the industry hoped that this would have happened before now, but even a year from now such a move would still save millions of people from having to learn new interfaces. As Windows becomes more prevalent and more companies selling non-Windows products adopt the Windows-ish interface, the chameleon interfaces become less important. But many major companies, such as Lotus, WordPerfect, and Symantec, are adopting the Windows-ish interface slowly or not at all.

BEYOND KEYBOARD AND MOUSE

For the first few years of the PC revolution, the entire user interface consisted of keyboards for input and character screens for output. Until VGA became common, no one bothered with graphics because the resolution was so low. In the mid-1980s, mice started to appear (again thanks to Apple) but didn't become common on PCs until last year. Even now, keyboard input is so ingrained in so many PC users that mouse-based interfaces almost always come with clunky keyboard equivalents—which are heavily used.

If keyboards have lasted this long with only minor inroads made by other devices such as mice, trackballs, and so on, it is unlikely that they will go away soon. The past year has seen an unprecedented amount of hype for pen-based systems. After all, many assert, it is more natural to write with a pen than to use a keyboard or a mouse. The pen has many advantages, namely its overlap with the current way people put ideas on paper. Pens are also handy for reducing the size of computers, since keyboards are often limiting factors in the design of common portables. Apple's prototypes of its future portable technology are based completely on pens for input.

However, pens have a long way to go before they are adopted as part of the common user interface. Their biggest problem, one that is being solved exceedingly slowly by computer industry standards, is that the handwriting recognition software is still very inaccurate. When you write yourself a note, no matter how rushed you are, you can usually make out over 99% of what you wrote when you later review the note. Pen handwriting recognition systems have around a 95% rate of success, or a 5% rate of failure. Even if that gets up to 98% in the next year or two, that means that one word out of ten will have an unrecognized or misidentified character. Even hunt-and-peck typists do better than one mistake per line.

The other major contender for the input part of the user interface is voice, but voice recognition is in even worse shape than handwriting recognition today. It is improving, but most voice systems need to be "trained" for the particular speaker; keyboards don't.

Many of us would love to get rid of our keyboards, but a replacement does not seem imminent. Our unhappiness with the keyboard may stem from our misuse of it over the years. Almost everyone uses software that has features that are hard to use or remember. No program, no matter how complex, should make you remember the difference between F7, Alt-F7, and Alt-Shift-F7. But we continue to buy those programs and resent them instead of demanding that any program have an interface that matches the way we think. ■

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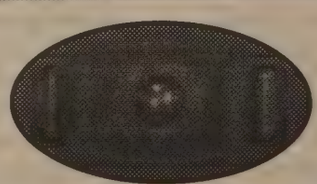

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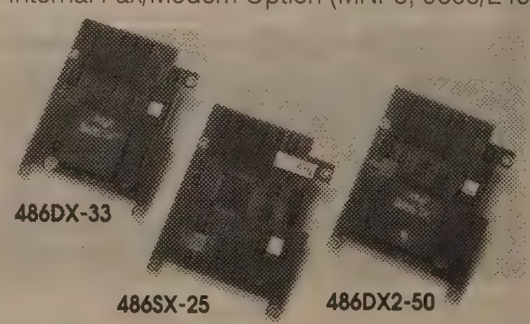

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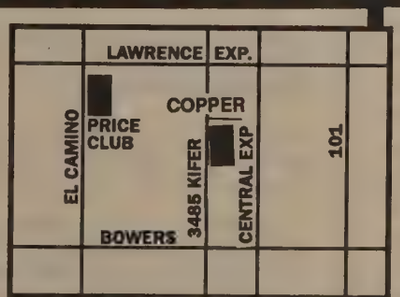

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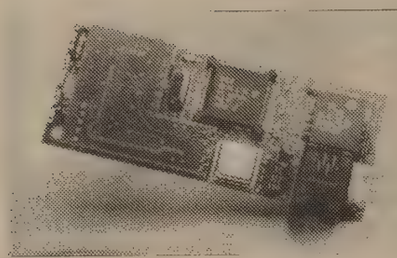
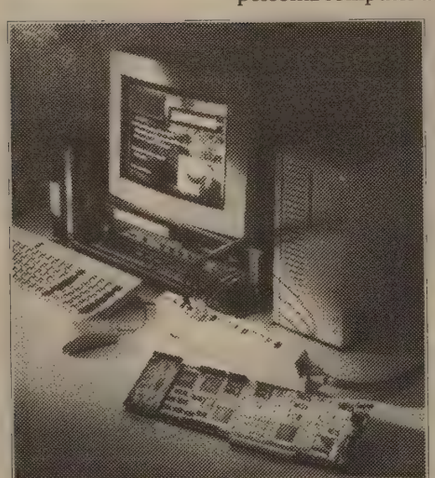


RADIUS VIDEOVISION

VideoVision is a new desktop product that enables a personal computer user to combine computer graphics, text, analog and digital video, and sound, and output them easily and directly to standard VHS videotape. This package consists of a single, digital interface card with built-in video input, video output and 24-bit graphics display capabilities, an external connector panel for video and audio connections, and comprehensive software controls. The interface card fits in a NuBus slot of any Mac II, IIx, IIcx, IIci, IIfx, or Quadra. VideoVision doubles as a 24-bit color frame buffer that can display photo-realistic images from any application, eliminating the need and cost of a separate display interface card. ($2399) Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (408)434-1010.



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PRODUCT UPDATES

➤**Autodesk** is shipping **Generic CADD for the Macintosh v2.0**. Generic CADD is now compatible with AutoCAD Release 11 and incorporates other new features to make it easier to learn and operate. Autodesk Retail Products, 11911 N. Creek Pkwy. S., Bothell, WA 98011. 1-800-228-3601.

➤**Claris** announced **MacDraw Pro 1.5**. Current users of MacDraw Pro may update to v1.5 for $15. MacDraw II users may upgrade for $99. Claris Corp., 1-800-544-8554.

➤**The Complete PC** announced the **Complete Communicator Gold**, which enhances its current product to include a new V.32 data modem with V.42bis for data throughput up to 38,400bps. The Complete PC Corp., 1983 Concourse Dr., San Jose, CA 95131. (408)434-0145.

➤**Concentrix Technology** released **Connections 2.1**, an upgrade to its integrated personal information manager for the Macintosh. Registered users can upgrade for $29.95. Concentrix Technology, Inc., 1875 Grant St., Suite 760, San Mateo, CA 94402. (415)358-8600.

➤**DayStar Digital** is including, for an **unlimited time, software utilities from Connectrix**. All PowerCache adapters for the SE/30, Mac II, IIx, and IIcx will include a copy of MODE32, a demo version of HandOff II, and a HyperCard version of the Macintosh Memory Guide, all from Connectix. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. 1-800-962-2077.

➤**DeltaPoint** released a maintenance for **DeltaGraph Professional for Macintosh 2.01**. This update is available to any registered user at their request. DeltaPoint, Inc., 2 Harris Ct., Suite B1, Monterey, CA 93940. (408)645-4813.

➤**Everex** announced **price reductions** on most **Tempo Carrier 386SX/20 notebook computers**. Everex Systems, Inc., 48431 Milmont Dr., Fremont, CA 94538. 1-800-821-0806.

➤**Great American Software**, now **MECA Software**, announced **One-Write Plus v3.0**, a significant upgrade to the entire One-Write Plus product line. New pricing was also announced. MECA Software, Inc., 55 Walls Dr., Fairfield, CT 06430-0912. (203)256-5000.

➤**Intel** released **LANSight Support 3.0** for Microsoft LAN Manager and IBM LAN Server networks, a server-based troubleshooting tool for day-to-day management of local area networks. Intel PC Enhancement Division, 1-800-538-3373.

➤**Microsoft** is shipping the **Microsoft Mail Gateway to X.400 v 3.0**. The new release allows Microsoft Mail users to send messages, binary files, and multimedia objects from one LAN to another across an X.400 backbone, using a technique called message encapsulation. Microsoft Corp., 1-800-426-9400.

➤**SBT** released **SBT Professional Series 2.0**, its new accounting system that was developed in Fox Software's FoxPro 2.0. SBT Corp., One Harbor Dr., Sausalito, CA 94965. (415)331-9900.

➤**Teleware** announced **M.Y.O.B. for Windows v3.0** Registered users of v2.0 can upgrade for $79 plus shipping and handling. Teleware, Inc., 30 Roundhill Dr., Rockaway, NJ 07866. 1-800-322-MYOB.

➤**UDS Motorola** released **GlobalView 2.0**, its Windows-based, dial-up modem management system. GlobalView is a graphical network management system that lets a central site operator manage hundreds of dial-up modems from a single console. UDS Motorola, 5000 Bradford Dr., Huntsville, AL 35805-1993. (205)430-8000.

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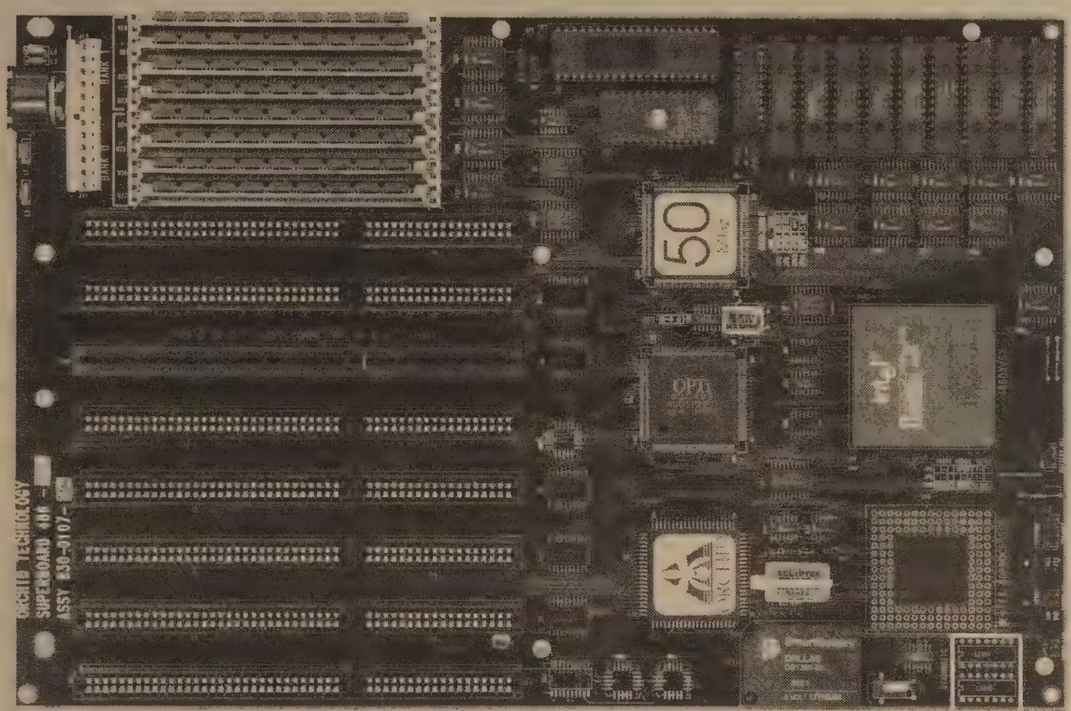

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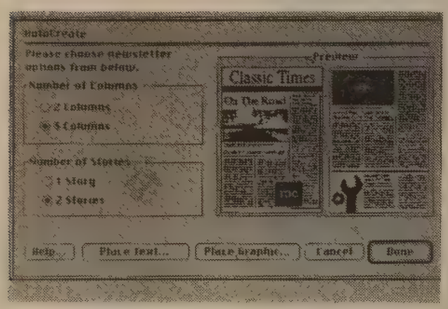
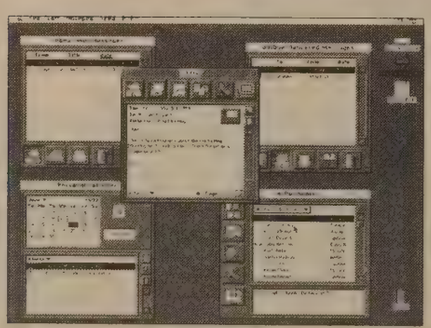
Personal Press, an entry-level page layout program, is the first page layout software to design and assemble users' text and graphics automatically. As part of its underlying automation technology, v2.0 includes over fifty "intelligent" AutoCreate templates, which will make publications practically create themselves. These templates will present users with a series of options regarding how they'd like the document to look, and will guide them through creating it with their own text and graphics. The program will then design, build, and clean up the document down to the last detail, so it will be ready to print in a matter of minutes. ($199) Silicon Software, Inc., a subsidiary of Aldus Corp., 9770 Carroll Center Rd., Suite J, San Diego, CA 92126. (619)695-6956.



ASANTÉ PERSONTOPERSON

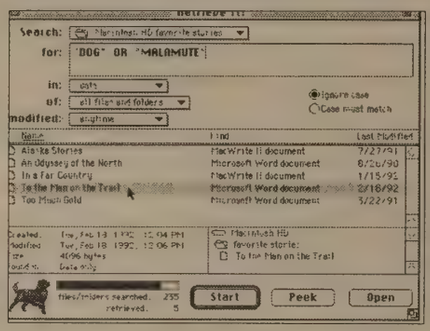
PersonToPerson is a comprehensive network communications application that enables Macintosh users to exchange voice messages and text files without a server. Aimed at departmental workgroups, PersonToPerson eliminates the cost and complexity of a dedicated server, allowing users to install the program as a desk accessory.



In addition to facilitating interoffice communication, PersonToPerson provides monthly and daily calendars with timed reminders, an In/Out board for tracking the whereabouts of coworkers, a built-in personalized screen saver, and file transfer capabilities. It is 100% compatible with AppleTalk, TokenTalk, and EtherTalk. (The list price for a two-user Twin Pack is $149, a ten-user Pack is $399, and a Zone User Pack is $699) Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (408)752-8388.

RETRIEVE IT!

Retrieve It!, a new text-finding utility for the Macintosh, is designed to make it easy to swiftly hunt inside files and find any text—including partial names, phrases, or numbers. A Peek window allows the user to find, view, and copy information in found files as the search continues in the background. The sophisticated text retrieval capabilities enable the user to find, for

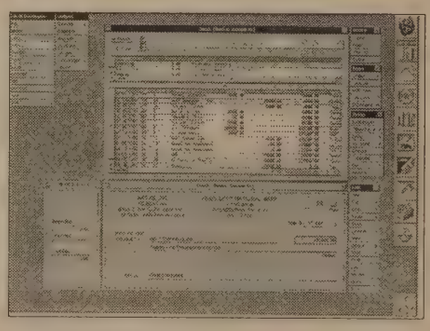


example, all files containing "Clinton" and "Bush," but not more than three occurrences of "Perot." Retrieve It! uses a dog icon that barks when the hunt is over. ($129) MVP Software, Inc., PO Box 282, Cupertino, CA 95015-0282. (415)599-2704.

NEXT SOFTWARE

FISCAL DIMENSION

Designed by a CPA who has extensive expertise in computer systems, rather than by people whose primary background is computer programming, Fiscal Dimension is the first general purpose accounting application created specifically to work with



NeXTSTEP. The first version of the software, the Personal version, is aimed at individuals and small businesses. Fiscal Dimension is form-based and transaction-oriented. Users enter transactions into the program's database using entry screens that resemble actual forms. Although Fiscal Dimensions is as easy to use as a single-entry bookkeeping system, it is a full-fledged double-entry system that can serve as a powerful general ledger. ($249) AXSYS, Inc., PO Box 1184, Bala Cynwyd, PA 19004-1184. (215)667-6822.

OTPROVIDE

OTProvide is a database link between relational databases and Lotus Improv. Objective Technologies is the first developer to create third-party software for Improv using the Improv API Toolkit. OTProvide allows all levels of users to obtain data stored in relational databases and integrate that information into Improv models without using the Structured Query Language. OTProvide runs on NeXT computers with NeXTSTEP 2.0, Lotus Improv with the API Kit, and Sybase. Version 1.0 provides access to Sybase databases only. Version 2.0, due to be released after NeXTSTEP 3.0, will provide access to Oracle databases. ($850 for a single floating license; $499 for a single machine-lock license) Objective Technologies, Inc., 7 Dey St., Suite 1502, New York, NY 10007. (212)227-6767.

PRINTERS

HP PAINTJET XL300 COLOR PRINTER

The HP PaintJet XL300 is a plain-paper color printer designed to enable business, creative, and technical professionals to bring color

printing capabilities in-house for presentation graphics, merged text and graphics, color proofing, desktop publishing, and computer-aided design. It is the first color printer compatible with the HP LaserJet II family of printers, as well as the first color printer to feature HP's color implementation of the PCL 5 printer language, PCL 5C. It produces 300dpi resolution and features automatic I/O switching for simultaneous connection to PC, Macintosh, and network environments. ($3495. With Adobe PostScript Level 2 is $4995) Hewlett-Packard Co., 1-800-752-0900.

LASERMASTER WINJET 300

The WinJet 300 is a software and hardware Windows printing enhancement for HP LaserJet users. It features LaserMaster's host-based architecture that relies on the host computer for printing processing power; letting the WinJet 300 take advantage of the powerful 386 and 486 computers that users have already purchased to run

Continued

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80387SX-25	149.00
80387SX-20	139.00
80387SX-16	135.00
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83D87-25	159.00
83D87-33	169.00
83D877-40	189.00

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	8MB	529.00
T3100SX,T3200SX,TSXL	2MB	109.00
	4MB	159.00
T1200EX,T1600,T3100E	2MB	109.00
T3200	3MB	169.00
T5100	2MB	109.00
T5200,T5200C,T8500SL	2MB	109.00
	8MB	349.00
T3100	2MB	239.00
T4400,T6400,T3300SL	2MB	199.00
NEW T3300SL	4MB	319.00
	6MB	495.00
T4400,T6400	8MB	729.00

IBM

	Memory Added	Price
L40SX	2MB Mem.	109.00
	4MB Mem.	169.00
	8MB Mem.	369.00

COMPAQ

	Memory Added	Price
Portable III	2MBKit	$129.00
Portable386/20	1MBKit	179.00
	4MBEXP	459.00
Portable LTE286	1MB BD	119.00
	2MB BD	149.00
	4MB BD	459.00
Portable LTE386S/20	1MB BD	179.00
	1MB BD	129.00
	4MB BD	279.00
SLT/286	1MB BD	99.00
	4MB BD	319.00
SLT/386	2MB BD	189.00
	4MB BD	249.00

NEC

	Memory Added	Price
UltraLite 286F	1MB MD	$229.00
	4MB MD	599.00
Prospeed SX/20	1MB BD	159.00
	4MB BD	439.00
Prospeed 286	1MB BD	139.00
386SX/16	2MB BD	259.00
	4MB BD	399.00
Ultralte III	2MB	199.00
	4MB	429.00
NEW Ultralite SL/20	8MB	829.00
NEW	2MB	199.00

ZENITH

	Memory Added	Price
S.S./SX	2MB	$149.00
	ALPHA 2MB	149.00
	BETA 2MB EXP	159.00
Slimsport	2MB CD	189.00
286e	4MB CD	429.00
Turbosport 386e	1MB BD	159.00
	4MB BD	495.00
Mastersport SX/SL	2MB	159.00

OTHERS

	Memory Added	Price
AST Ext. Notebook	1MB SIMM	$79.00
	4MB SIMM	209.00
Sharp PC-6220 Notebook	1MB BD	139.00
TiTM2000	1MB BD	129.00
TiTM3000	2MB Kit	129.00
Everex Tempi LX	2MB MD	159.00
Panasonic CF-170,270, 370	1MB CD	129.00
Epson NB3S	1MB UPG	159.00
	4MB UPG	399.00
Tandon NB386	2MB	99.00
	8MB	379.00

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	Memory Added	Price
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Mac IIci,IIsi	1MB Kit	69.00
Mac IIsi	2MB Kit	149.00
Mac Ici,IIsi	4MB Kit	199.00
Mac IIsi	8MB Kit	469.00
Mac IIci,IIsi	16MBKit	599.00
Mac IIfx	4MB Kit	189.00
	16MB Kit	669.00
Mac SE,SE 30, Plus, II, IIcx,IIx	4MB Kit	189.00

AST

	Memory Added	Price
Bravo 486/25	2MB Kit	119.00
	8MB Kit	329.00
Prem 386/SX16 & 20, 25, 33	8MB Kit	329.00
Prem II SX/20	1MB Kit	59.00
SX/16	4MB Kit	159.00
Cupid Exp.	0K BD	249.00
Premium 386C	1MB Kit	59.00
WKST & Bravo Premium	4MB Kit	189.00
Fastram	286 512-2MB BD	289.00
FastramKit 512Upg.		55.00
Premium 386	1MB Kit	59.00
	4MB Kit	229.00

COMPAQ

	Memory Added	Price
DP 386/ 33,486/25,33 & Systemp	2MB MD	$119.00
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DP 386/ 20e,20 & 25e,25	1MB BD	119.00
	4MB BD	269.00
	1MB MD	89.00
	4MB MD	169.00
DP-386 S/16	1MB BD	119.00
	4MB BD	269.00
	1MB MD	89.00
	4MB MD	169.00
DP 286N, 386N, & 386SX/20	1MB MD	59.00
	2MB MD	99.00
	4MB MD	179.00
	OK BD	89.00
DP 386/16	1 MB BD	239.00
	2 MB BD	479.00
	8 MB BD	799.00

IBM

Works w/Model	Price
50Z,55SX,70-E61,	$ 50.00
70-121,P-70	
50Z,55SX,70-E61,	90.00
70-121,P-70	
55SX,65SX,55LS,	169.00
34F3077	
70-A21,A61,B21, B61	90.00
30/286	90.00
PS/1	99.00
80-041	79.00
80-111,31	109.00
80-A21,A31,A61	199.00
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50 & 60 Series	279.00
50 & 60	249.00
PS/2 Model 57SX,90,95	8MB MD 369.00

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NEC

	Memory Added	Price
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	8MB BD	1,059.00
P.M.SX/20	2MBCPU UPG.	179.00
	2MB	259.00
	UPG. & Exp. 2MB	119.00
	UPG. Kit	
P.M.SX/16	2-8MB Exp.	209.00
	2MB	119.00
	UPG. Kit	
P.M.386/20	2MB MD	339.00
	8MB MD	859.00
P.M.386/25S	2MB Kit	179.00
	8MB Kit	599.00
P.M.386/25	2MB MD	339.00
	8MB MD	859.00
	8MB Repl BD	1,099.00
P.M.386/33E&486/25E	2MB MD	209.00

ZENITH

	Memory Added	Price
Z-386/20, 25,33,33e	1MB SM	$ 59.00
	2MBSM	99.00
	4MBSM	179.00
Z-386SX, 286-LP+,Z-LS	2MBSM	99.00

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H.P.Laserjet IIIsi	1MB Module	69.00
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H.P.Deskjet	256K Module	59.00
IBM 4019,4019e	2MB Module	119.00
	3.5MB Module	189.00
OKI Laser 400	1MB Module	89.00
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OKI Laser 800,820	2MB Module	129.00
	4MB Module	199.00
Panasonic 4450	1MB Module	119.00
Panasonic 4420, 44501	2MB Module	119.00
	4MB Module	199.00
Panasonic 4455	2MB Module	159.00
Epson EPL6000	2MB Module	119.00
	4MB Module	209.00
Epson Action Laser II	2MB Module	199.00
	4MB Module	299.00
T.I. MicroLaser, XL	1MB Module	69.00

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1X9-80	40.00	256X4-80	4.50
1X9-70	42.00	4464-80	2.50
4X9-80	135.00	4464-10	2.00
4X8-80	130.00		

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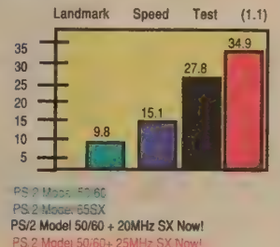

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PRODUCT SPOTLIGHT

Windows. The WinJet 300 also includes a direct GDI Windows print driver and full PostScript compatibility. The WinJet 300 upgrades a Hewlett-Packard LaserJet II, IID, III, and IIID, and requires a 386 or 486 computer with at least 8MB of RAM and Windows 3.1 running in enhanced mode. ($495) LaserMaster Corp., 6900 Shady Oak Rd., Eden Prairie, MN 55344. (612)944-9330.

ULTRASCRIPT PC 3.01

Compatible with almost any printer, UltraScript PC 3.01 now offers MS-DOS, Windows 3.x, and Macintosh users the ability to create high-quality PostScript language text and graphics in color and print them on a non-PostScript printer. This PostScript interpreter gives users the opportunity to create PostScript documents in many current popular applications that support PostScript printers, such as WordPerfect, Microsoft Word, PageMaker, Lotus, and Excel. Users are able to produce high-quality text and graphics, in color or black and white, on almost any non-PostScript laser printer, inkjet, or dot matrix printer. ($195) PM Ware, Inc., 346 State Pl., Escondido, CA 92029-1365. (619)738-6633.

PC HARDWARE

SPARCARD 2

SPARCard 2 is a coprocessor board for IBM PCs and compatibles that provides the performance and functionality of Sun Microsystem's SPARCstation 2. Based on the 40MHz SPARC processor, this card turns any standard PC into a dual-processing workstation able to run both DOS/WINDOWS and SPARC applications simultaneously. Because applications run on native processors, users do not need to worry about degradation of application performance, as they would with emulation programs. Opus software also supports file transfers between the two environments. ($4145. The SPARCard 2 Kit, which consists of a SPARCard 2, 8MB of RAM, a 213MB pre-installed hard disk, Solaris 1.0, and a color frame buffer lists for $6265) Opus Systems, Inc., 329 N. Bernardo Ave., Mountain View, CA 94043. (415)960-4040.

INTEL OVERDRIVE PROCESSOR

OverDrive Processors—a line of single-chip performance upgrades—can be easily installed to fill the vacant OverDrive Processor socket found in most Intel486/SX

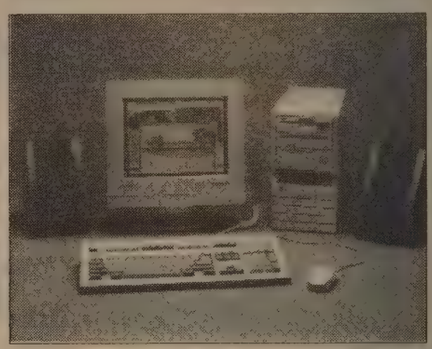
microprocessors. Based on Intel486/DX2 speed-doubling technology, the OverDrive Processor allows users of Intel486/SX systems to double the internal speed of their computer's CPU by adding a single chip, without upgrading or modifying any other system component. Unlike math coprocessors, these processors improve both floating point and integer performance on all DOS, Windows, OS/2, and UNIX applications by up to 70%. (OverDrive Processor for 16 and 20MHz, Intel486/SX systems has a suggested list price of $549; for 25MHz systems, $699) Intel Corp., 3065 Bowers Ave., PO Box 58065, Santa Clara, CA 95052-8121. (408)765-8080.

ACROS PERSONAL ACTIVITY CENTER

The Personal Activity Center unites computing and consumer electronics features into a single, integrated system designed to support users' broad requirements for office productivity, communication, education, and entertainment. On this 386SX personal computer Acros combines a digital answering machine, AM/FM receiver, eight-channel mixer, fax, data modem, a CD-ROM drive, and other features along with pre-loaded office applications, online tutorials, and reference guides on a CD-ROM. It also includes StarSmart software that automatically switches the Personal Activity Center on to receive a fax or voice phone call. When the transmission is complete, the system turns off. Acer America Corp., 2641 Orchard Pkwy., San Jose, CA 95134. (408)432-6200.

CLOVER MPC-I 486-33

Three powerful graphics boards—the ProPC video card, ProColor Plus, and ProVGA TV—enable the MPC-I 486-33 to output to a host of peripherals such as video cameras, VCRs, CD Laser stations, and TV monitors. Housed inside a mini-tower, the standard MPC 486-I



is built around a 33MHz, 486 Intel CPU, 4MB of RAM (expandable to 32MB), 64K cache, two floppy drives, and a 120MB hard drive. The standard unit also features an NEC Intersect CD-ROM drive and 14" non-interlaced SVGA monitor, complete with a 16-bit SVGA graphics board featuring the S3 graphics accelerator chip set. ($5949) Clover Systems, Inc., 1430 Koll Circle, Suite 102, San Jose, CA 95112. 1-800-925-6837.

NEC POWERMATE 486SX WITH LOCAL BUS

Teaming 486-based computing power with local bus video technology, the PowerMate 486SX/25i is designed for graphics-intensive

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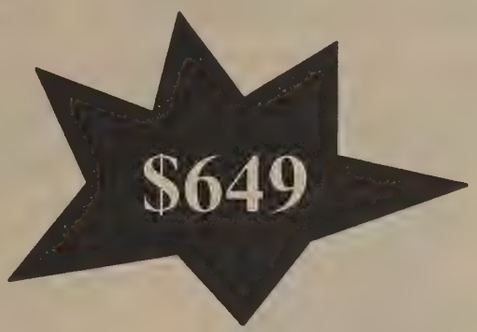

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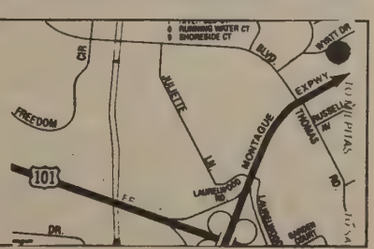


PRODUCT SPOTLIGHT

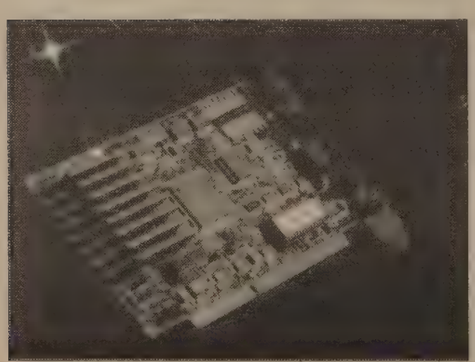
Windows, CAD, and imaging applications. For users anticipating the need for increased computing capacity, this unit is modularly designed, allowing easy and cost-effective upgrades to 33MHz or 50MHz systems. This system features Image Video, NECs implementation of local bus video technology. Image Video gives users improved graphics performance—up to 400% faster information display than standard VGA—without requiring an additional graphics coprocessor board. ($2599 with 120MB hard drive) NEC Technologies, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719. (508)264-8000.

MICHAELANGELO VRAM 1280

Michaelangelo VRAM 128 is a Windows accelerator based on S3's 86C911 graphics processor, making large-screen, high-resolution computing affordable to more people. While many other accelerators using an S3 video adapter only provide interlaced modes, Michaelangelo VRAM 128 offers the capacity to generate non-interlaced 1280 x 1024 graphics. The S3 86C911 graphics engine was designed with Windows in mind, incorporating many Windows-related graphics routines directly into the graphics coprocessor instead of requiring additional CPU overhead. ($395) IOcomm, Inc., 12700 Yukon Ave., Hawthorne, CA 90250. (310)644-6100.

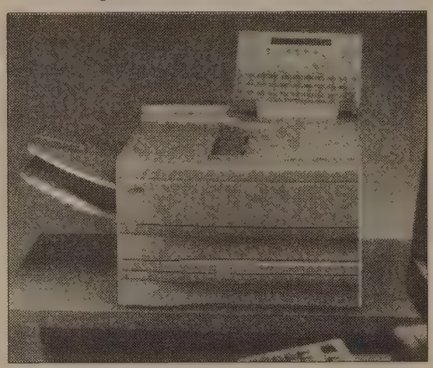
GRAPHTEK 2 WINDOWS ACCELERATOR

GraphTEK 2, a Windows accelerator based on the Weitek W5186 User Interface Controller, is designed to increase the on-screen performance of Windows-based business application software. It provides four to five times the performance on a standard 386SX system compared to standard VGA in the same system. GraphTEK 2 is a half-slot, 16-bit card that fits into ISA and EISA systems. The card includes Windows 3.x drivers, software drivers for most of the popular DOS applications, free future driver upgrades, and unlimited technical support. ($199 for the base configuration of 512K VRAM) AvTech Development, Inc., 1001 S. Placentia Ave., Fullerton, CA 92631-5105. (714)773-5880.



XEROX 7033LAN FAX SERVER

The 7033 LAN Fax Server enables users on a Novell LAN to send and receive facsimile transmissions from their desks. Users can fax documents by using a pop-up window on their computer screen, without leaving other applications running under MS-DOS or Windows. Incoming faxes can be printed on the 7033 fax terminal or an optional laserprinter, stored electronically in the network file server, or directed automatically to confidential mailboxes. Network users can access a list of faxes in their mailboxes, and then view, print, save, route, re-fax, or delete each fax. The 7033 is also available for walk-up users, as an auxiliary network printer, and as a digital copier. It copies at a rate of five copies per minute and offers multiple copying, electronic collation, five levels of reduction, and two levels of enlargement. ($7895) Xerox Corp., Xerox Sq. 05B, Rochester, NY 14644. 1-800-TEAM-XRX.



PC SOFTWARE

RAOSOFT SURVEY FOR CAMPAIGNS

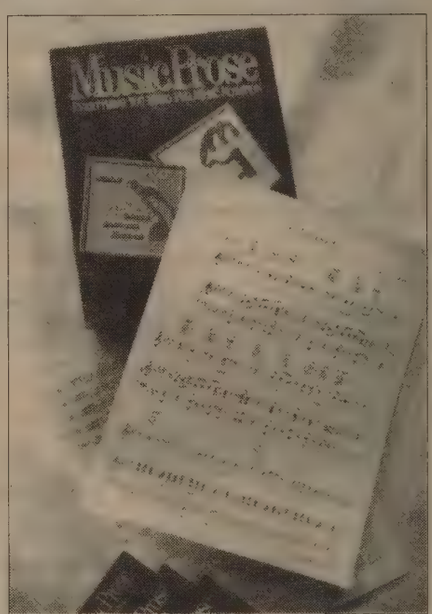
Survey for Campaigns is a full-featured, DOS-based political campaign software package. Designed with intuitive screens that are easy for computer novices to use, it contains both advanced pooling capacity and database management capability. This campaign software provides for polling, volunteer and contribution database management, and report writing. There are ready to use reports, surveys, and database forms that can also serve as templates for a campaign manager to adapt. Sample mail merge and mailing label templates are also included. The software is directly compatible with dBASE files, and imports ASCII and WK-1 type files. ($499. The UFILL run-time version is $50) Raosoft, Inc., 6645 N.E. Windermere Rd., Seattle, WA 98115. (206)525-4025

MYHOUSE

RAIR Computer, one of the first private computer firms in Hungary, has released myHouse 1.0, a drawing program that lets the user design a house and then view both the interior and exterior from any viewpoint in a 3-D perspective, and in color. myHouse lets you design, renovate, or rearrange your home using any IBM XT, AT, PS/2, or compatible. The program provides a wide variety of building elements, including curved walls and pillars. Design your own stairs and roofs, and select your windows and doors from the myHouse library. ($99) RAIR Computer, Ltd., 17 Main St., Watertown, MA 02272-9154. (617)924-7916.

MUSICPROSE FOR WINDOWS

MusicProse for Windows offers desktop publishing software designed for musicians. By combining ease of use with a powerful notation engine, MusicProse for Windows allows musicians to use a personal computer to enter, edit, play back, and publish everything from simple lead sheets to full orchestrations using standard notational methods. Users can create scores with up to thirty-two staves, each with multiple voices. From the multi-staff conductor's score, composers can use MusicProse to automatically extract parts of each instrument. MusicProse is compatible with both Windows 3.0 and Windows 3.1, and supports most MIDI input and output devices. ($249) Coda Music Software, Inc., 1401 E. 79th St., Bloomington, MN 55425-1126. 1-800-843-2066.



Continued on page 182

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EISA 486DX-50C/256	1,287	1,749	1,799
EISA 486DX-33C/256	907	1,378	1,428
ISA 486DX-50C/64	837	1,318	1,368
ISA 486DX2-50/64	755	1,225	1,275
ISA 486DX-33C/64	615	1,075	1,125
ISA 486SX-25C	375	855	905
ISA 386DX-40C/64	339	808	858
ISA 386DX-33C/64	329	798	848
ISA 386DX-25	309	778	828
ISA 386SX-25	269	738	788

BASIC SYSTEM CONFIGURATION: Motherboard & CPU, 1MB main memory installed, 2HD/2FD controller with **2 serial, 1 parallel and 1 game ports**, 1.2MB or 1.44MB floppy drive, mini-tower case with 200W power supply and 101-key enhanced keyboard.

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4MB memory
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Mini tower case w/200W PS
1.2MB & 1.44MB floppy drive
IDE w/**2 serial/1 parallel/1 game**
101-key enahnced keyboard
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386SX-20 Notebook, 2MBmemory, 40MB HD $1295

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California Resellers!

✦ Be a part of the MicroTimes 1992 Computer and Software Buyers' Guide

Maximize your sales and profits with the year-end issue of **MicroTimes**, on-street 12/9/92. This special issue is a year-round resource, featuring a comprehensive **Buyers' Guide and Reseller Directory** to make the most of your busiest selling season and bring you new customers in 1993. We invite you, as a reseller of computer products in California, to participate by completing and signing the attached **Reseller Poll** and mailing or faxing it to us no later than **October 1, 1992.**

✦ This Buyers' Guide Will Increase Your Sales

MicroTimes will showcase your store, your products, and your service. Here's your perfect opportunity to spotlight your store—tell your potential customers about the unique service your business offers, your in-house experts and the guidance they provide in such areas as LANs, Desktop Publishing, Systems Integrations, Accounting, and other specialties.

In addition to listing your store's name and other information alphabetically by geographical area, this year we're offering an additional feature to enable your prospective customers to find you quickly: **a separate directory of vendor-authorized sales, service, training and support providers.** So if you're authorized to provide these services for Novell, IBM, Apple, Sun, Hewlett-Packard, or other name-brand products, please give us that information so we include your name in the vendor-authorized listings.

✦ A Great Place For Your Advertising Message

The year-end issue of **MicroTimes** will bring customers into your store during your most important selling season and throughout the following year. They'll see your message next to an exciting lineup of editorial features, including our writers' picks for the best hardware and software products of 1992 and over 30 pages of Buyers' Guide announcing new products and special offers—many of which you'll already have in stock, ready to sell!

You'll also benefit from our own special promotions of this exciting issue which will appear in October and November. **MicroTimes** will help you build the consumer excitement you need to ring up sales as you ring in the New Year.

✦ Take Advantage Of This FREE Editorial Listing!

Complete the attached form and return it to **MicroTimes** before October 1, 1992. **If your store has more than one location, please use a separate form for each.**

And plan now to make the most of your selling season with the **MicroTimes 1992 Computer and Software Buyers' Guide!**

✦ For advertising information, call (510)934-3700 or (213)851-8600.

MicroTimes 1992
Computer and Software Buyers' Guide Reseller Poll

Mail to: Reseller Poll, 3470 Buskirk Ave., Pleasant Hill, CA 94523
Fax: (510)934-7351
Deadline: October 1, 1992

Store Name:_____

Store Manager:_____

Address:_____

City:_____ **State:**____ **ZIP:**_____

Phone:_____ **Fax:**_____

What applications does your business specialize in, and who are your in-house experts for each specialty? (List up to three):

Specialty **Expert**

_____

_____

_____

What operating systems does your business support?

MS-DOS__ AmigaDOS__ Windows__ Windows NT__ UNIX (specify variety)_____
OS/2__ Macintosh__ Other (specify)_____

List the three top-selling brands sold at your store in 1991:

_____

What special value-added services (e.g. service, training, support, warranties, return policy, etc.) does your business offer? (Please keep responses under 25 words or we will edit them to fit available space.)

_____

_____

_____

Are you a vendor-authorized sales, service, training and/or support source?

If so, please list up to five vendors (e.g. Sun, Novell, Hewlett-Packard, Autodesk) who have authorized your business to provide these services, and check the areas for which you're authorized.

Vendor **Sales** **Service** **Training** **Support**

_____

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I certify that all the statements made in this survey are true.

Name:_____ **Title:**_____

Signature:_____ **Date:**_____

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486 33/50 MHz W/64K CACHE
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- 8K internal cache
- Landmark = 152/167
- Shadow RAM

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386 25/33/40 MHz W/64K CACHE
- 4MB up to 32MB
- Landmark = 44/56/65
- Shadow RAM

COMPLETE SYSTEM
$1118/1123/1129

486SX 20 MHz
- 4MB up to 32MB
- 8K internal cache
- Landmark = 92
- Shadow RAM

COMPLETE SYSTEM
$1157

386SX 16/25
- 4MB up to 8MB
- Landmark = 23.5/34
- Shadow RAM
- Page Interleave

COMPLETE SYSTEM
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COMPLETE SYSTEM INCLUDES: 4 MB RAM, 1.2 & 1.44 MB Floppy Drive, 120 MB Hard Drive, Trident VGA Card w/1 MB, and SVGA Monitor, IDE/IO Card, 101 Key Keyboard, Case & Power Supply

BASE SYSTEM INCLUDES:
Motherboard with CPU, 1MB RAM, 1.2 or 1.44 floppy drive, IDE controller, Enhanced 101 key Keyboard, mini-tower case or desktop case with power supply.

BASE SYSTEMS

486DX 33/50 MHz w/64K Cache	$645/899
486SX/20	$389
386DX 25/33/40 MHz w/64K Cache	$350/355/361
386SX 16/25	$273/293

Add $30 for 256K Cache
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OPTIONAL WITH SYSTEM PURCHASE

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12" mono w/mgp	$85
14" mono w/mgp	100
14" VGA 640x480 .39dp w/256K Card	249
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14" SVGA .28dp w/512K Card	319
14" Non-Int 1024x768 .28dp w/Trident 1MB Card	369

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80MB	245
100MB	279
120MB	299
130MB	301
200MB	489

CASE & POWER SUPPLY

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Desktop w/200 Watt	57
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Full Tower w/250 Watt	119

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MGP Card	$15
Floppy Controller	30
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SVGA w/512K	39
Trident w/1MB	59
I/O w/2S,1P,1GP	13
Orchid IIs	145
IDE Controller	13
1:1 Controller	55
SCSI DTC3280	110

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KX-P1123	205
KX-P1124i	279

HP LASER PRINTERS

LaserJet IIP+	$775
LaserJet IIP	995

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Logitech first mouse	$37
Logitech mouse man	63
Logitech Trackman serial	73
Microsoft compatible	14

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Teac 1.2 5.25"	$56
Teac 1.44 3.5" w/kit	55
Floppy 1.2 5.25"	49
Floppy 1.44 3.5" w/kit	48

MISC.

287-10	$40
387SX-16/25	99/110
387-25/33/40	110/110/130
DOS 5.0 w/system	48
Windows 3.1 w/mouse	62
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256K 9x70 simms	11

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386-25 64K	170
386-33 64K	175
386-40 64K	185
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386-33 256K	235
486SX-20	199
486-33 64K	469
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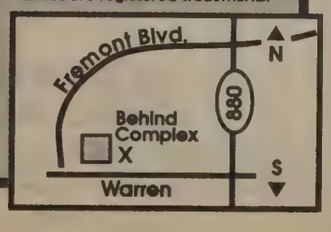

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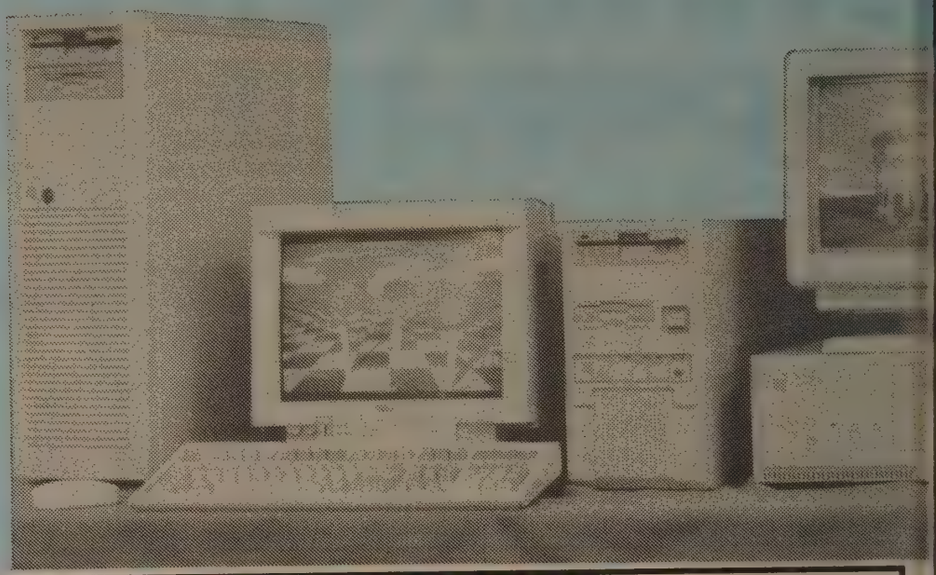

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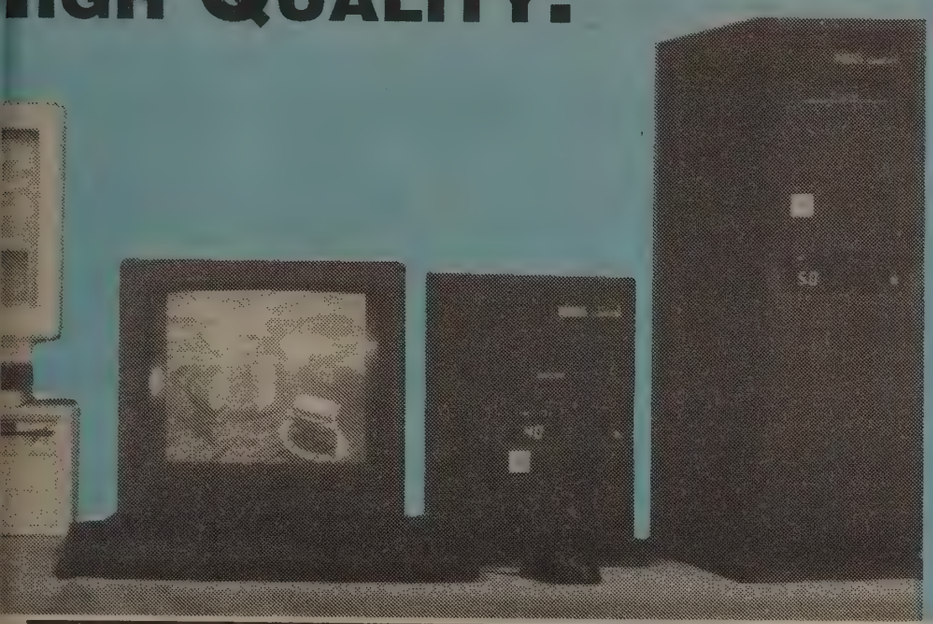

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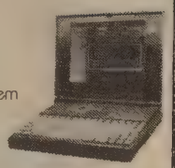

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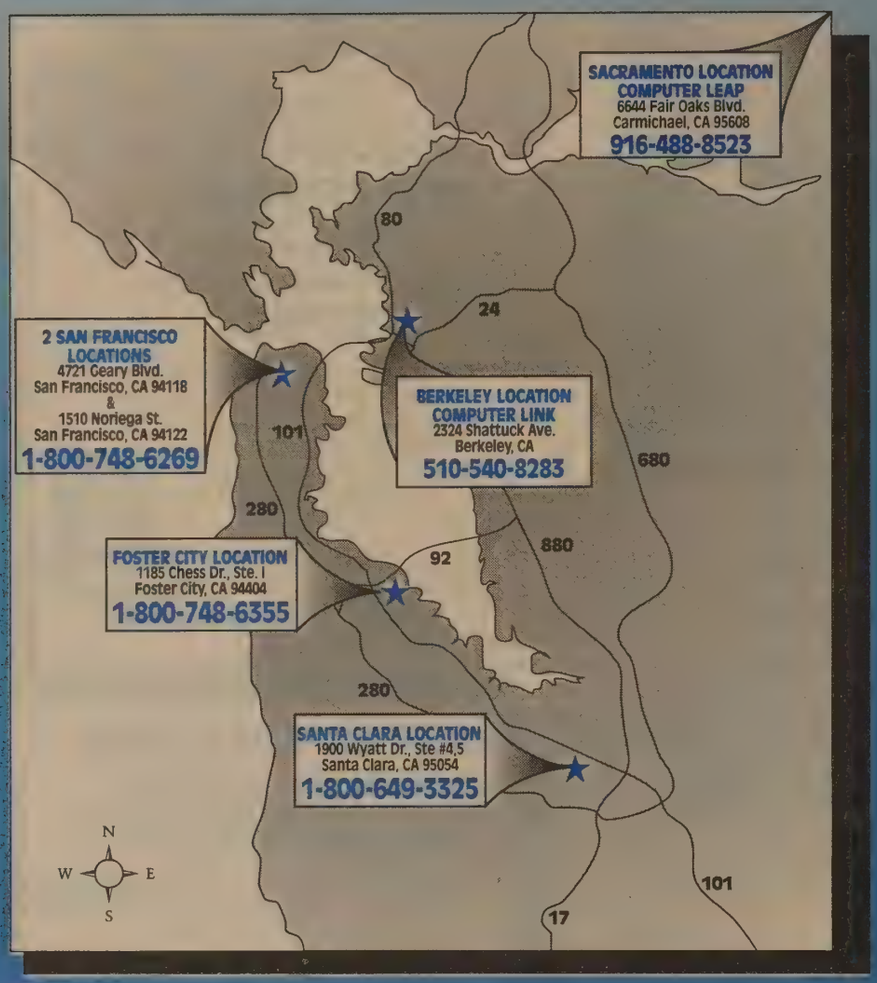

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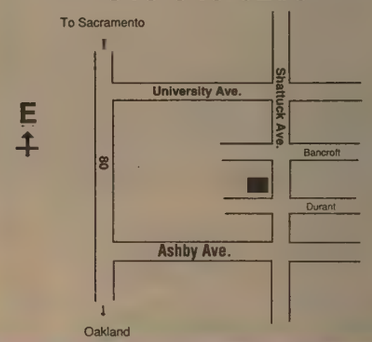

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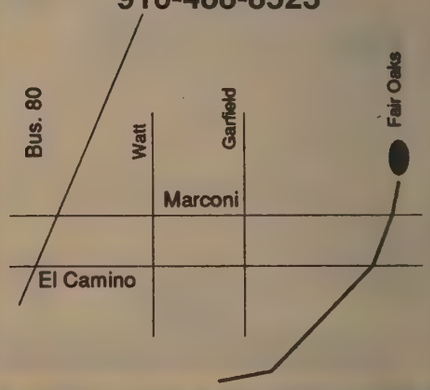

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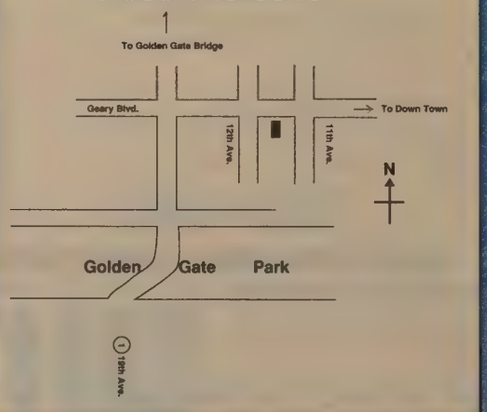

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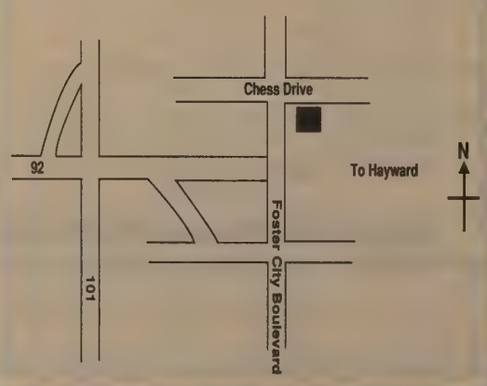

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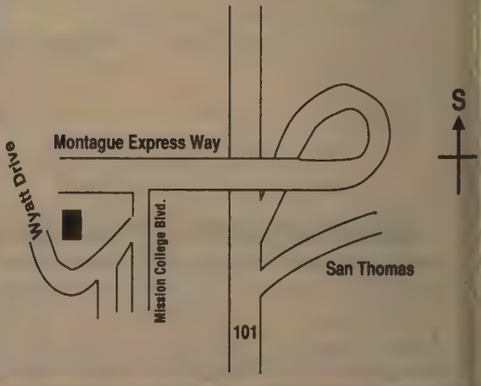

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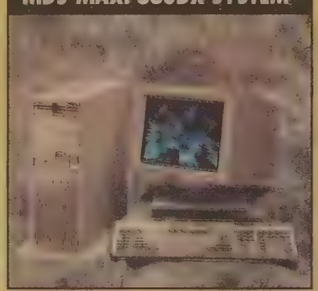

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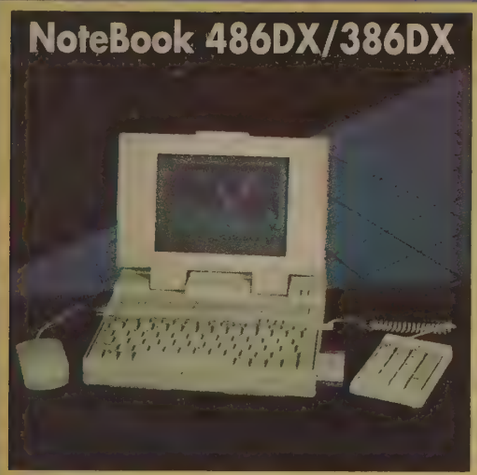

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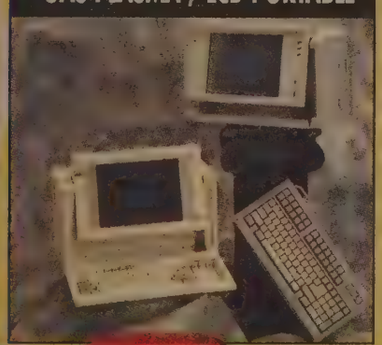

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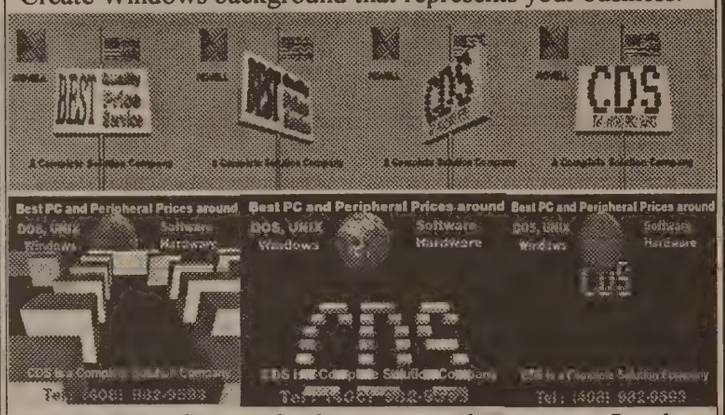

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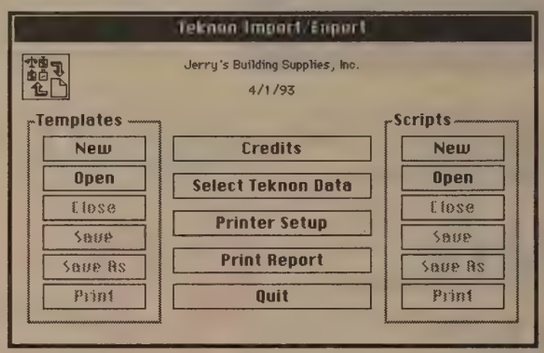

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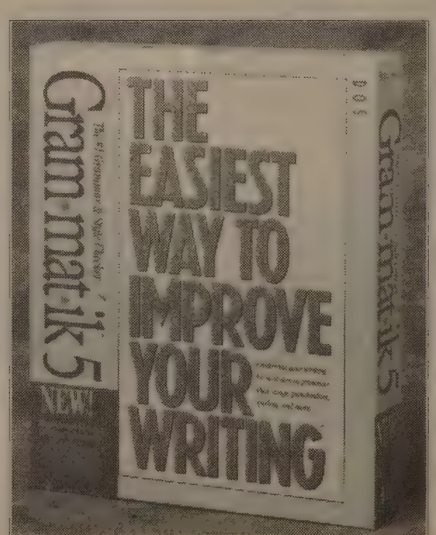

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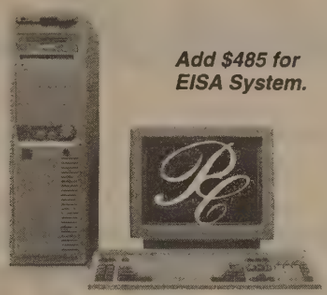

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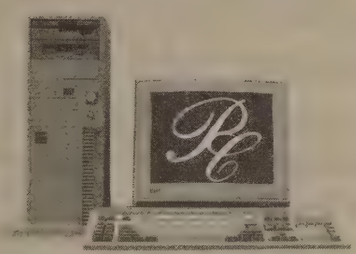

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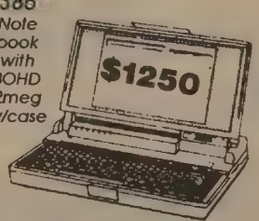

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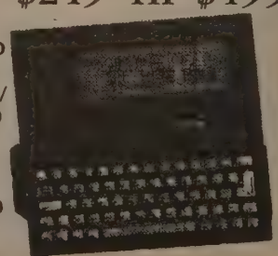

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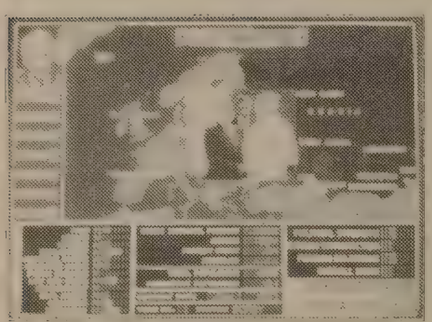
REVIEWS

GAMES

By Mike Markowitz

CRISIS IN THE KREMLIN

Designed By: Larry Barbu
Published By: Spectrum HoloByte
For: MS-DOS (640K, EGA/VGA graphics, mouse recommended, Ad Lib, Sound Blaster, and Roland audio cards supported)
List Price: $69.95



It's 1985. At a secret meeting in the Kremlin, the Central Committee of the Communist Party of the Soviet Union has humiliated your rivals and elevated you to the post of General Secretary. You are now one of the two most powerful people in the world. Armies of secret police agents, bureaucrats, and workers stand ready to do your bidding. Think fast. You're in *bol'shoye gorye* (Big Trouble).

Crisis in the Kremlin is a grand strategic, political, and economic simulation of the decline and fall of the former Soviet Union. This is a single-player game, in which you take the role of the leader of a major Communist Party faction—reformists, hard-liners, or nationalists. The software plays the roles of the other factions, Objective Historical Forces, or Fate.

As the game starts, you are called on to make an inaugural speech to declare your policy positions in ten key areas:

Style of Government	Military Posture
Diplomatic Policy	Trade Policy
Civil Rights	Media Freedom
Economic Policy	Work Week
Wage Controls	Private Ownership

You set policy by clicking the desired option, for example, Style of Government ranges from "despotic" to "ultra-liberal." After your initial policy decisions have been input, the display opens to a rather busy Main Screen, which includes a menu bar; a scrolling map; a set of "Action" buttons; and panels of social, political, and economic indicators. Social indicators, for example, include Food, Health, Housing, Employment, Personal Income, Consumer Goods, Public Services, Law and Order, Environment, and Civil Rights. The indicators are displayed as bar graphs, which can be green, yellow, or red, depending on how bad things have gotten. Economic indicators are displayed as numbers: Gross National Product, Assets, Foreign Credit, Reserves, Total Population, and Productive Population.

As the game proceeds you will be bombarded with dispatches, and crises will break out. You can go to the crisis phone bank, a desktop with four phones and a cup of tea. Pick up a phone and one of your top advisors will offer advice and alternatives. You can reject the advice by clicking on the teacup.

Every November you have the opportunity to set your budget for the coming year. You can simply accept the self-serving recommendations of your ministries, or you can allocate every ruble down to a rather detailed level.

If you allow any crisis to grow too great, you can be deposed, which ends the game. If you can survive in power for thirty years you win, and your tomb in Red Square will become a place of pilgrimage for the grateful sons and daughters of the Motherland.

Spectrum HoloByte has billed Crisis in the Kremlin as "the game that predicted the coup," a boast that might have seemed a little grander if the game had shipped six months sooner.

The 144-page user manual includes notes on strategy and extensive background material on Russian and Soviet history. The package also includes a paperback book, *Klass: How Russians Really Live* by David K. Willis. Dan Guerra's artwork effectively conveys the 1940s retro look we tend to associate with Soviet industrial design. Animated newsreels and sound files boost the file size of the game to an impressive 11MB.

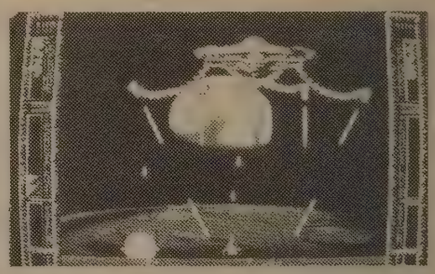
Graphics and Animation: 9
Sound: 8
User Interface: 8
Overall Play Value: 7

Crisis in the Kremlin would be a great classroom exercise for a course in political science or modern history. (Spectrum HoloByte, Inc., 2061 Challenger Dr., Alameda, CA 94501. 510/522-3584)

SUPER SPACE INVADERS

Designed By: Taito
Published By: Domark
Distributed By: Accolade
For: MS-DOS (640K, VGA, joystick recommended, popular audio cards supported) Amiga version also available.
List Price: $39.95

Space Invaders, designed by Toshihiro Nishikado, was one of the great coin-operated arcade games of the 1970s. If you missed the 1970s, the game involves shuffling formations of animated sprites that



drop inexorably toward the bottom of the screen while you blast gaps in their ranks with a zapper that slides left and right. This simple formula was insidiously addictive—children stole coins from their parents to play the game; executives took endless lunch breaks to play Invaders all afternoon. It became a worldwide social problem.

They're back. And now they've learned some new tricks.

For about 160 quarters, Super Space Invaders turns your PC into a convincing imitation of a state-of-the-art coin-op arcade game machine. There are dozens of levels, and the Invaders have a wide variety of tactics. The secret to success is the extra weapons you can collect by shooting a saucer that occasionally flits across the top of the screen. After you wipe out three successive waves of invaders, you arrive at the Cattle Mutilation bonus screen, where you attempt to prevent your cows from being abducted by aliens. If you're good enough, you eventually confront the End of Level guardians, vulnerable only in one spot.

Graphics and Animation: 9
Sound: 6
User Interface: 6
Overall Play Value: 7

The program is installed from four 360K disks. A 24-page booklet provides useful tips on strategy and diagrams of the patterns that the Invaders follow on each level. On the negative side, there seems to be no way to turn off the sound, or to bypass the rather long introductory animation sequence. (Accolade, Inc., 5300 Stevens Creek Blvd., San Jose, CA 95129. 408/985-1700)

GATEWAY

Designed By: Duane Beck and Bob Bates
Published By: Legend Entertainment
Distributed By: Accolade
For: MS-DOS (640K, VGA/EGA/CGA,

Continued on page 194

AMI

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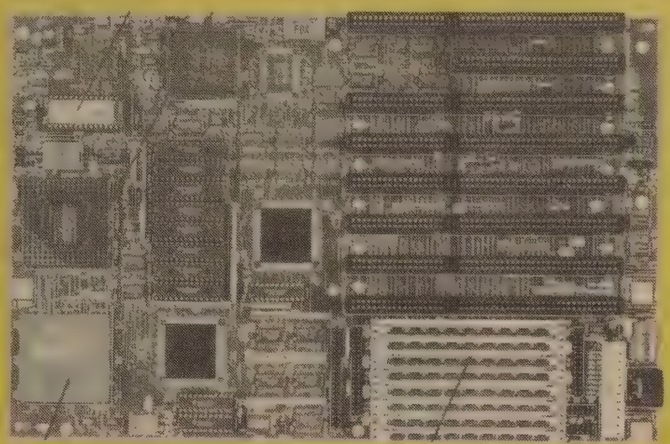

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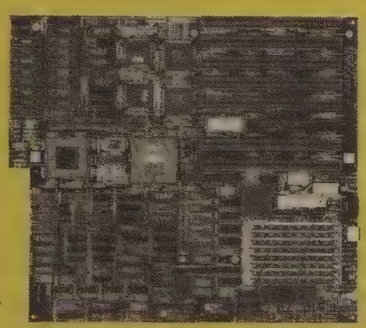

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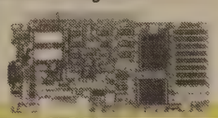

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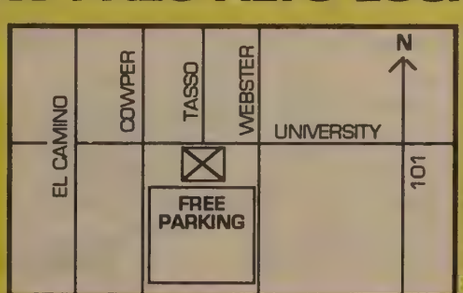

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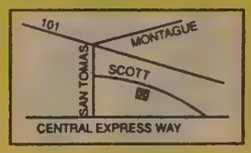

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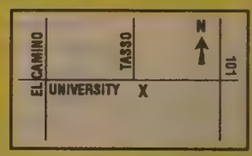

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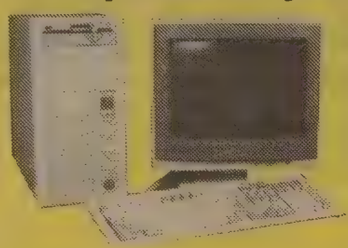

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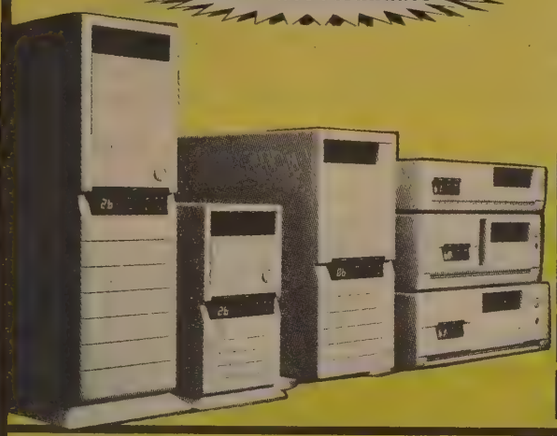

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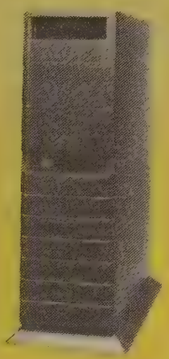

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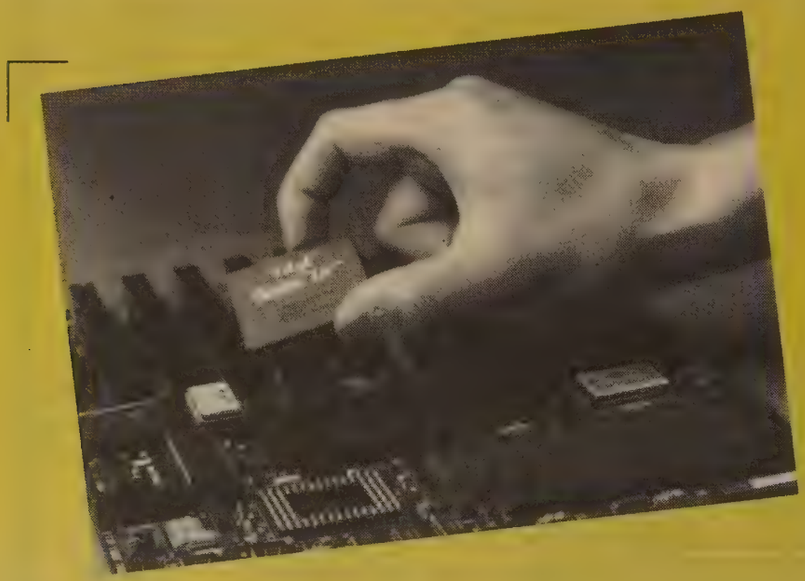

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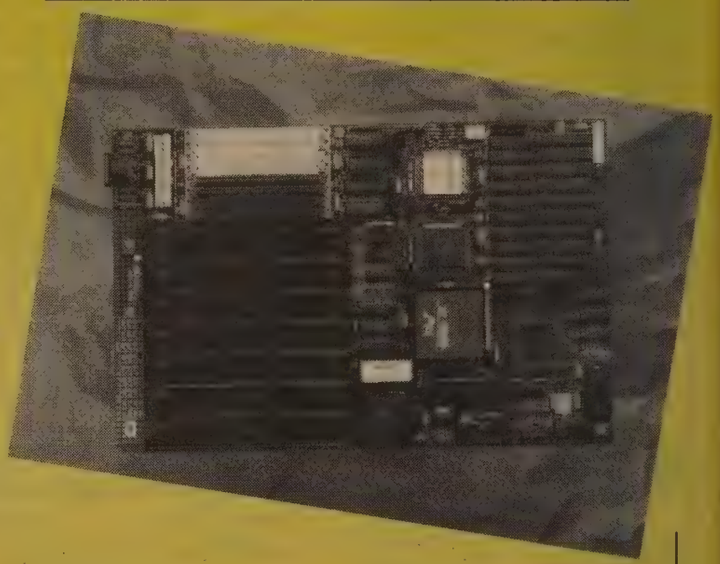

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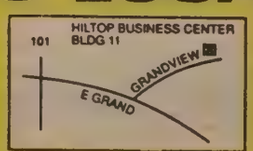

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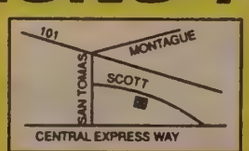

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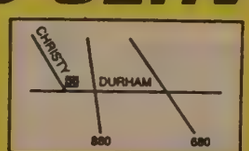

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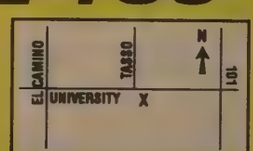

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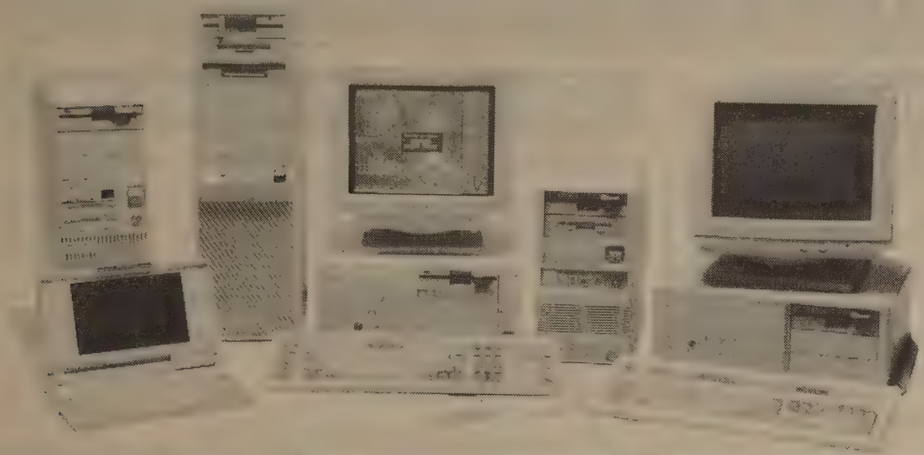

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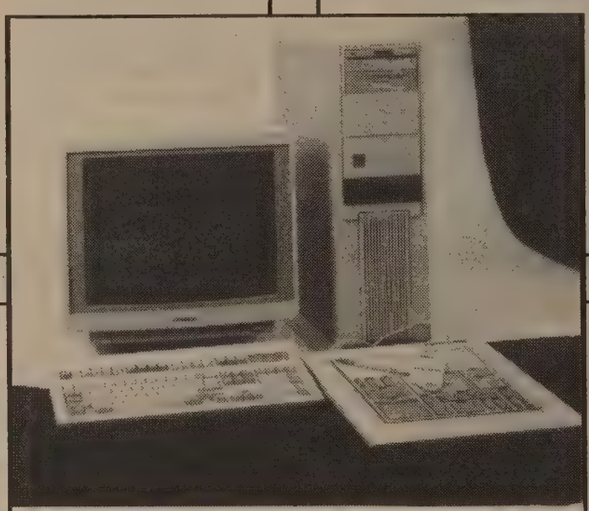

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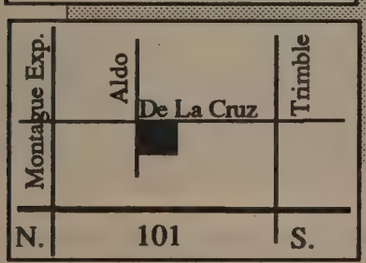
Kurta XLC 24X36	$1,295
Kurta XLC 18X24	$1,095
Kurta XLP 12X18	$595
Kurta XLP 12X12	$345



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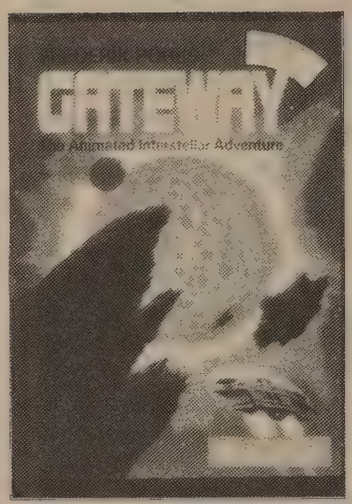
PRODUCT SPOTLIGHT

Continued from page 186

supports mouse and popular sound cards)
List Price: $59.95



Frederick Pohl's series of four Gateway novels are a high point in the generally depressing landscape of contemporary science fiction. The year is 2102 and Earth is dying from overpopulation and pollution. Back in 2077, on the outskirts of the solar system, the Gateway, an ancient, abandoned, alien space station had been discovered. Gateway is the base for a fleet of small faster-than-light spacecraft, still in working condition. The secrets of their navigation and propulsion systems baffle Earth's best scientists, but there is no shortage of volunteers willing to strap themselves into a cramped cabin and warp out to find Death or Glory where no person has gone before...

The design and programming team of Legend Entertainment tackled a big challenge in adapting this cult classic to the format and conventions of an interactive adventure game. The look and feel of the game will be instantly familiar to fans who have read Pohl's books, but it does not follow the exact plot lines and episodes in the novels. You take the role of a volunteer, newly arrived at Gateway and waiting for your first assignment from the Corporation that controls the station. The screen display includes a graphic window (256-color VGA, with some nifty cinematic animation); a text window, where the story unfolds; and a series of command buttons and scrolling lists that you use to compose your inputs. You definitely want a mouse for this game; there is no joystick support. You can examine objects in the graphic window by clicking on them, or pick them up by double-clicking.

Graphics and Animation: 9 (awesome)
Sound: 8
User Interface: 8
Overall Play Value: 8

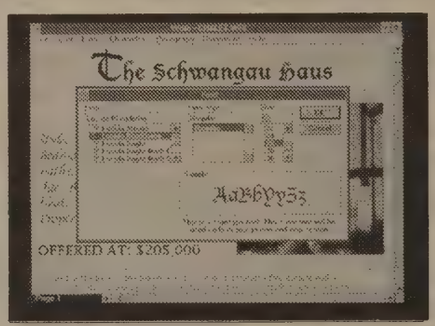
For 7MB of hard disk space you get an entire galaxy, with many exotic planets to explore, difficult puzzles to solve, and countless ways to die horribly. As you probably guessed, the object of the game is a quest to save the Galaxy, but first you have to figure out what you're supposed to do. This may take many hours or days, especially if you resist the temptation to peek into the clue book, which is graciously included in the package. (Legend Entertainment, Inc., 14200 Park Meadow Dr., Chantilly, VA 22021. 703/222-8500)

PC SOFTWARE REVIEW

TRUETYPE FONT PACK FOR WINDOWS

Published By: Microsoft
List Price: $99.95
Reviewed By: Woody Liswood

Now that you have Windows 3.1, you have a basic collection of TrueType fonts. This means that when you select a TrueType font (which, as you recall, is shown in the fonts windows as a "tt" font), you will get the same font used in printing and in screen displays. Everything will work the way you expect a GUI environment to work. It also means that you have become more device-independent that in the past, since a TrueType font will print essentially the same on a laser printer, a PostScript printer, or your favorite dot matrix printer.



Windows 3.1 contains fourteen TrueType fonts.

TrueType Font Pack adds an additional fourty-four fonts, some of which, when added to the basic Windows 3.1 collection, give you, essentially, the same set of fonts found in a PostScript printer.

In addition, there are twenty-two fonts created by Lucida. This set of fonts provides the ability to make your documents look even better than the PostScript-only junkies. You have Lucida fonts for additional icons, arrows, dingbats, calligraphy, handwriting, faxes, and math symbols and characters to enliven your documents.

Installation is the now-standard Windows installation technique. Put your disk in a disk drive, go to the run command in the file manager, and run setup on the floppy drive.

The documentation really is not needed. However, it does contain some lucid descriptions of fonts, font families, and printouts of all the font characters.

If you can't remember how to get one of the high-order characters into your document (a character that you can see on the screen but cannot directly type from your keyboard), don't forget that with 3.1 you got a character map and that you can display the character map, switch to the font you are using, select the character you want in the document, and copy and paste that character into your document.

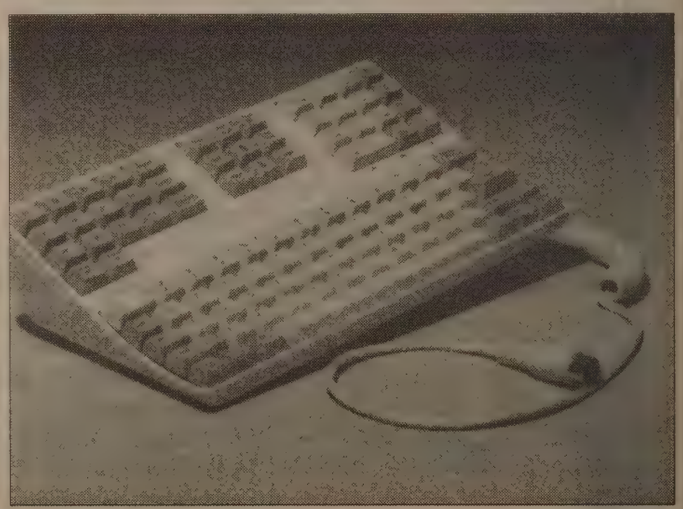
If you run Windows 3.1, this package, for me, is a necessity. At the very least, it gives you screen fonts for the PostScript fonts; and at the very best, it gives me more fonts that I can use in my day-to-day consulting practice. (Microsoft Corp., One Microsoft Way, Redmond, WA 98052. 206/882-8080, 1-800-426-9400)

PC HARDWARE REVIEW

MICROTYPE KEYBOARD

Manufactured By: Datalux
List Price: $98
Reviewed By: Paul Hoffman

Desk space is often hard to come by. Most PCs are fairly large and keyboards are often huge: typically 19.5" x 7.5". There is lots of wasted plastic there, taking up space on your desk that you would probably rather use for greater mouse mobility or papers. Datalux saw the need for a small keyboard and produced the Microtype, a complete 100-key keyboard that is only 10.5" x 6.5". Instead of putting the numeric keypad to the right of the main keyboard, it is above the main keys, as are the function keys and the arrow keys. Getting used to the layout will take you all of five minutes, given that the keys are labeled with large, easy-to-read captions. The play of



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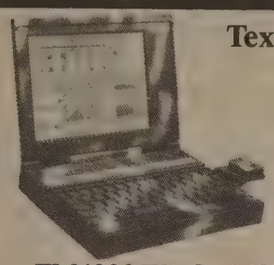

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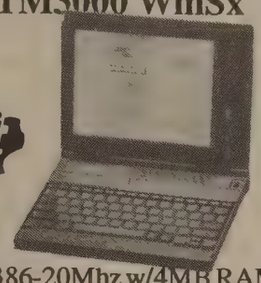
- 5.7 Pound 486SX/DX Notebook
- 10" VGA Display 640 X 480
- 4MB RAM Expandable to 6MB
- MS-DOS 5.0,Winodws 3.1,TravelPoint Device.

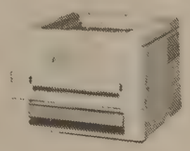
TI TM3000 WinSx



- 80386-20Mhz w/4MB RAM
- 10" VGA 640 X 480
- 60MB /80MB /120MB HD
- DOS 50, Windows 30
- Travel Point Mouse

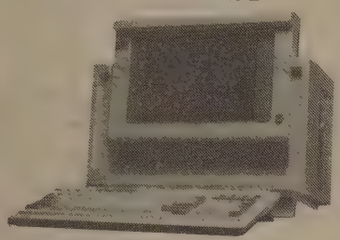
$1999 / $2299 / $2499

TI MicroLaser



- PS17 9PPM $1199
- PS35 9PPM $1475
- PS35 Turbo 9PPM $1899
- PS17XL 16PPM .. $2499
- PS35XL 16PPM .. $2799
- PS35XL Turbo ... $3289
- AppleTalk for Mac $99

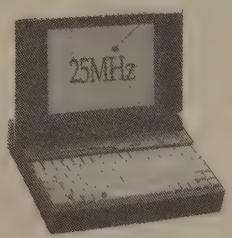
LCD / GAS PLASMA VGA PORTABLE



- 80386-33DX
- 1MB Exp. to 32MB
- 2 or 3 expansion Slot
- 1.2MB w/FHDC (1.44MB optional)
- VGA 640 X 480 16 Gray Sacle
- 2 Serial 1 Parallel
- 120MB Hard Disk
- One yearWarranty Parts & Labor

$1695 LCD / **$ 1895** G.P.

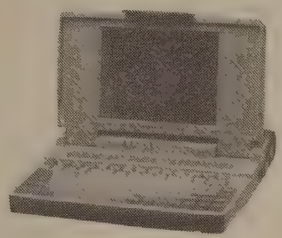
386-25SXL Notebook



- 80386-25SXL 2MB Exp. to 8MB
- 60MB/80MB/120MB Hard disk
- Stand-by Mode(includes CPU,I/O and
- Peripheral automatic power down)
- 1.44mb Micro Floppy Drive
- 1 Serial, 1Parallel, VGA Ext. Port
- Ext, 101Keyboard Port, Mouse port
- One SCSI Port, Car Cigarette Cable
- One year Warranty Parts & Labor

$1699 / $1799 / $ 1999

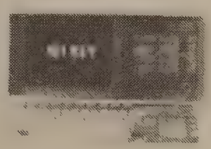
386-33DXL Notebook



- 80386-33DX w/8K Cache
- 4MB Exp. to 12MB
- 9.5" VGA LCD, 64 Gray Sacle
- 1.44mb Micro Floppy Drive
- 1 Serial, 1Parallel, VGA Port, 1 kb port
- Options:Fax/Modem,SCSI Port, more ...
- Suspend/Resume mode,sleep mode
- 80MB/120MB Hard Disk
- One year Warranty Parts & Labor

$1959 / $2099

486-33DX Notebook



- 80486-33DX w/8K Cache
- 4MB Exp. to 16MB
- 8.5" VGA LCD, 32 Gray Sacle
- 1.44mb Micro Floppy Drive
- 2 Serial, 1Parallel, VGA Ext. Port
- Ext. 101Keyboard Port,
- sleep mode
- 120MB Hard Disk
- One year Warranty Parts & Labor

$2395

McTEK 386-25SX/DX

- 80386-25SX / 25DX
- 1MB Exp. to 32MB
- 8 Expansion Slot
- 1.2MB Floppy Drive
- 2 Serial, 1Parallel
- 101 Enhenced Keyboard
- 40MB Hard Disk (25ms)
- Option : VGA card and monitor
- One year Warranty Parts & Labor

$599 / $659

McTEK 386-33/40DX

- 80386-33DX / 40DX w/64K Cache
- 1MB Exp. to 32MB
- 8 Expansion Slot
- 1.2MB Floppy Drive
- 2 Serial, 1Parallel
- 101 Enhenced Keyboard
- 40MB Hard Disk (25ms)
- Option : VGA card and monitor
- One year Warranty Parts & Labor

$699 / $759

McTEK 486-33/50DX

- 80486-33DX/ 486-50DX w/64K Cache
- 4MB Exp. to 32MB
- 7 Expansion , 1 Local Bus Slot
- 1.2MB Floppy Drive
- 2 Serial, 1Parallel
- 101 Enhanced Keyboard
- 120MB Hard Disk (17ms)
- Option : VGA card and monitor
- One year Warranty Parts & Labor

$1399 / $ 1799

McTEK 486-33/50 (EISA)

- 80486-33DX w/64K Cache
- 4MB Exp. to 32MB
- 8 Expansion Slot
- 1.2MB Floppy Drive
- 2 Serial, 1Parallel
- 101 Enhanced Keyboard
- 120MB Hard Disk (25ms)
- Option : VGA card and monitor
- One year Warranty Parts & Labor

$1859 / $2299

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Trident VGA w/512K $69
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Tseng Lab VGA 32,768 color .. $135
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HP III $1450
HP Desk Jet Plus 500 ..... $409
HP Desk Writter (Mac) $409
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Citizen GSX 130 ..... $255
Citizen PN48 ..... $345
Citzen 200GX (9 Pin) $169
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Logitech Trackman $89
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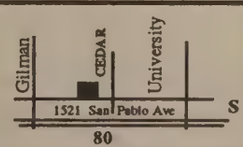

the keys is tighter than regular PC keyboards, but it still feels fairly natural. If you are tight on desk space or just want a better-designed keyboard, the Microtype will give you back lots of wasted space. (Datalux, Inc., 2836 Cessna Dr., Winchester, VA 22601. 703/662-1500)

MULTIMEDIA EQUIPMENT REVIEW

ELECTRIC-FILM FORMAT ACID TEST (EFFAT)

Published By: First Light Video Publishing
List Price: Varies, depending on format: VHS, 3/4-inch, Betacam SP
Reviewed By: Matthew Leeds

This is not hardware, it's not exactly software either. If you are getting into desktop video, oftentimes your largest investment is in video hardware not computer hardware. The Electric-Film Format Acid Test (EFFAT) tape can help you decide which video format makes the most sense for your work.

EFFAT provides a comprehensive comparison of video and film formats through the recording and editing process. A standardized test scene with a person and colored objects is shown in over one hundred split-screen and back-to-back comparisons. Nine video formats are compared: VHS, 8mm, S-VHS, Hi8, U-Matic, U-Matic SP, Betacam, Betacam SP, and D2; also three film formats are shown: Super 8, 16mm, and 35mm. Each format is shown in several tests: interior scene, exterior scene, film vs. video, generational loss, and a comparison of component vs. composite and chip vs. tube camera.

This tape can be used to dispel several myths that surround video production and the retention of quality images. While even the VHS version of the tape can provide significant direction to your purchasing plans, I highly advocate arranging to view this tape in the Betacam SP version if at all possible. This will eliminate any distortions inherent in lesser video formats and allow you to evaluate each test on its own merits. The included manual explains the equipment and test specifications, and offers guidance in evaluating the test results.

First Light is an excellent source for instructional videotapes on the media arts. If you have any interest in film, video, or music production I highly recommend that you contact them for their catalog. (First Light Video Publishing, Inc., 8536 Venice Blvd., Los Angeles, CA 90034. 1-800-777-1576)

CD-ROM SOFTWARE REVIEWS

IMAGECELS CD-ROM LIBRARY

Published By: Imagetects
For: DOS, Windows, Macintosh, and Amiga
List Price: $395
Reviewed By: Matthew Leeds

Imagetects is a supplier of quality photo-realistic libraries of texture maps and backgrounds. All of their texture maps are designed to be tiled and can be used with any presentation, animation, modeling, paint, desktop publishing, multimedia, or

rendering software. This library contains 1150 texture maps and images in a combination of materials including brick, marble, metals, roofing, stone, tile, water, wood, and sand. There are also doors, light and other fixtures, furniture, sky scenes, people, and vehicles. All of these are provided in 8-bit, 16-bit, and 24-bit versions in several file formats for DOS, Windows, Macintosh, and Amiga computers.

To solve the indexing problem across so many diverse platforms, Imagetects provides a laminated ring-bound index with both a directory tree to each file and a photo-illustration of each file. This makes browsing easy as your computer does not need to be on, nor does it need to be present while deciding on which images may be used.

If the price tag attached to this voluminous collection is too high, subsets of the complete library are available at lower prices. The images are mostly of excellent quality with a great variety of textures and colors. I've been able to make considerable use of the images in several applications over the past few weeks. (Imagetects, Inc., 7200 Bollinger Rd., Suite 802, San Jose, CA 95129. 408/252-5487)

COMPOSER QUEST

Published By: Dr. T's Music Software
List Price: $99
Reviewed By: Woody Liswood

Composer Quest is an application whose time has arrived! Multimedia Windows creates a growing desire (and need) for music to use with your PC. On a single CD-ROM, Composer Quest gives you a selection of music samples from composers since 1600. This is predominantly classical music with some classic jazz.

There are several ways to find the composer or music you want. The easiest is to make a selection from a time-line screen showing the major musical periods—a type of GANTT chart for music. When you select a specific historical period, Composer Quest gives you the selection of the composers it has for that period.

As part of a game, Composer Quest will play a mystery melody and let you search for the composer. However, unless you are an expert's expert, finding the correct composer may humble you. Be prepared.

On my Multimedia Windows PC, the music sounds great, but there is not enough of it. When you find something you like, you should run to your favorite music store, get the CD of the entire piece, and return to your computer to listen.

In addition to the musical selections, Composer Quest contains 256 full-color screens showing artwork from each time period and portraits of the composers.

I was humbled by the trivia questions, the built-in quizzes, and even the mystery music. Making the assumption that I knew something about classical and jazz music, I thought this would be fun. I found that what I thought I knew was such a small piece of the musical pie, that I spend many happy, if non-income-producing hours, exploring the sounds of Composer Quest.

This is one of those CD-ROMs that I would have in my collection, if for no other reason than to show folks a *real* multimedia application under Windows. (Dr. T's Music Software, 100 Crescent Rd., Needham, MA 02194. 617/455-1454)

THE VIEW FROM EARTH

Published By: Warner New Media
List Price: $79.98
Reviewed By: Matthew Leeds

Warner New Media continues to cover new ground in repackaging and presenting older information in a new way. This CD-ROM contains interactive material covering the July 11, 1991, solar eclipse and the contents of three Time Life books from the "Voyage Through the Universe" series. Hundreds of color images, two hours of audio narration, more than a thousand text screens, diagrams, and maps have been put together in something that is more than a book and different from a video documentary.

The bulk of the CD contains narrated slide

Continued on page 201

True Local Bus 486 Computer

Unleash the full power of the 486 CPU with the HD Local Bus 486 Computer. You get lightning fast video display running at the CPU clock speed (upgradable to 100 MHz!) and with 65,536 colors. Speeds that are 15 times ISA and 5 times EISA.

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* 1.2 MB 5 1/4" Floppy Drive
* 1.44 MB 3 1/2" Floppy Drive
* 32 bit Hard Disk/Floppy Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 32 bit ET-4000 SVGA Card (65,536 max colors, 1280 x 1024 max resolution)
* 14" Viewsonic 6 Monitor (1024x768) Non-Interlaced 0.28 dot pitch
* 132 Key Focus 5001 Keyboard
* Vertical Case with 9 Drive Bays, Digital Display and 250W Power Supply plus "Ultra Quiet" Cooling Fan
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0
* MS Windows v 3.1

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50 MHz $ 2395

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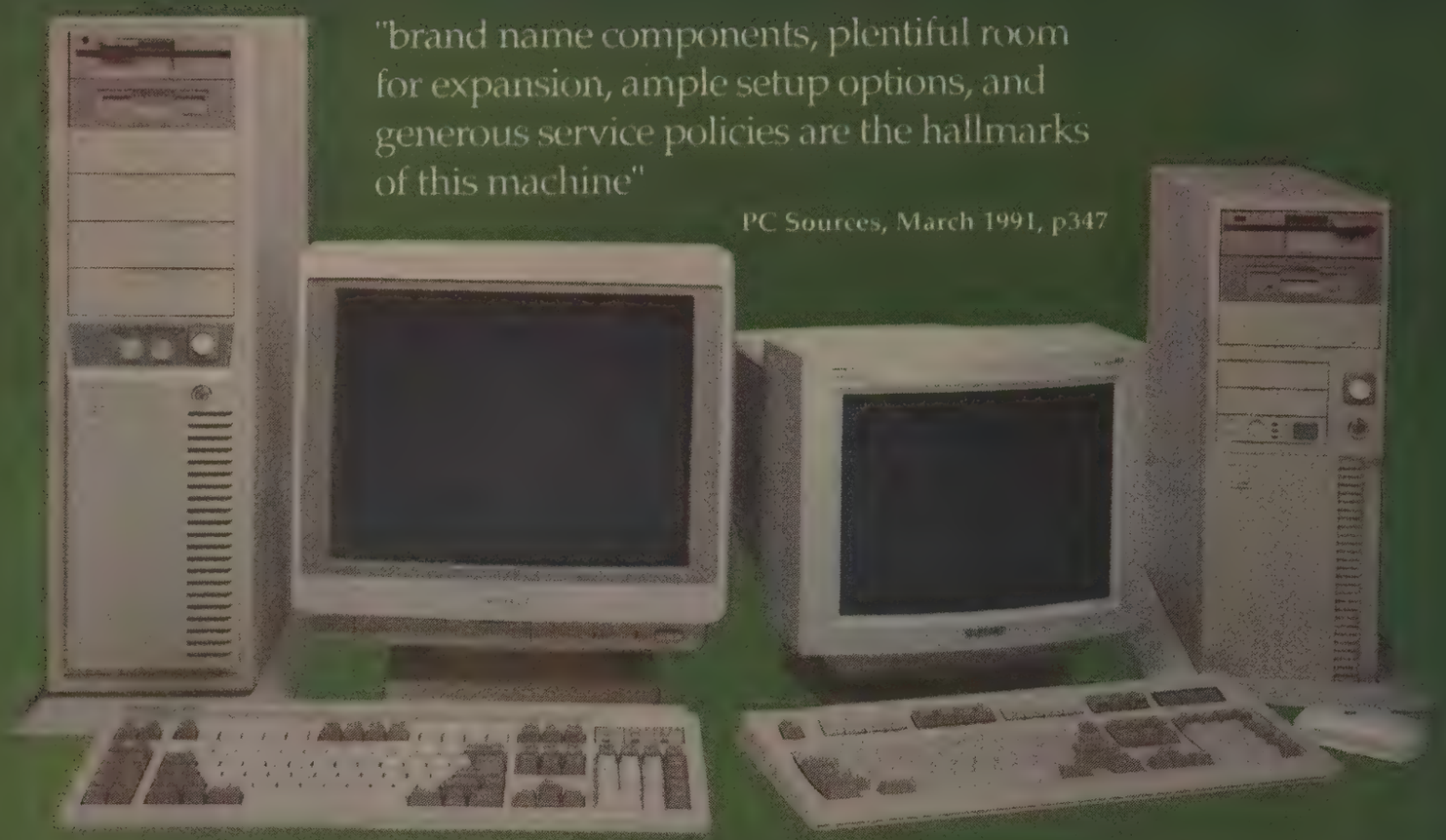

"brand name components, plentiful room for expansion, ample setup options, and generous service policies are the hallmarks of this machine"

PC Sources, March 1991, p347

486-50 MHz 256K Cache

* 4 MB RAM Expandable to 32MB Onboard
* 200 MB 15 ms Hard Disk
* 1.2 MB 5 1/4" Floppy Drive
* 1.44 MB 3 1/2" Floppy Drive
* 1:1 Interleaved 2FD/2HD Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 14" Non-interlaced Super VGA Monitor (1024x768) 0.28 dot pitch
* 1 MB 16 bit SVGA Card
* 101-Key Enhanced Keyboard
* Vertical Case with 250 W Power Supply
* Built-in Math CoProcessor
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0
* MS Windows v 3.1

$2295

Options:

* 120 MB Hard Disk Less $200
* 340 MB Hard Disk Add $400
* Viewsonic 6 Monitor Add $65
* TSENG VGA Card Add $40
* ORCHID IIS VGA Card Add $60
* SPEEDSTAR VGA Card Add $60
* EISA Motherboard Add $350
* RAM Add $40/MB

486-33 MHz 256K Cache

* 4 MB RAM Expandable to 32MB Onboard
* 200 MB 15 ms Hard Disk
* 1.2 MB 5 1/4" Floppy Drive
* 1.44 MB 3 1/2" Floppy Drive
* 1:1 Interleaved 2FD/2HD Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 14" Non-interlaced Super VGA Monitor (1024x768) 0.28 dot pitch
* 1 MB 16 bit SVGA Card
* 101-Key Enhanced Keyboard
* Vertical Case with 250W Power Supply
* Built-in Math CoProcessor
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0
* MS Windows v 3.1

$1995

Options:

* 120 MB Hard Disk Less $200
* 340 MB Hard Disk Add $400
* Viewsonic 6 Monitor Add $65
* TSENG VGA Card Add $40
* ORCHID IIS VGA Card Add $60
* SPEEDSTAR VGA Card Add $60
* EISA Motherboard Add $350
* RAM Add $40/MB

486SX-20 MHz 64K Cache
486SX-25 MHz 64K Cache

* 4 MB RAM Expandable to 32MB Onboard
* 120 MB 16 ms Hard Disk
* 1.2 MB 5 1/4" Floppy Drive
* 1.44 MB 3 1/2" Floppy Drive
* 1:1 Interleaved 2FD/2HD Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 14" Super VGA Monitor (1024x768) 0.28 dot pitch
* 1 MB 16 bit SVGA Card
* 101-Key Enhanced Keyboard
* Vertical Case with 250 W Power Supply
* Socket for Weitek CoProcessor
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0
* MS Windows v 3.1

SX-20 MHz $1495
SX-25MHz $1550

Options:

* 200 MB Hard Disk Add $200
* 256K Cache Add $100
* Non-interlaced Monitor Add $50
* TSENG VGA Card Add $40
* ORCHID IIS VGA Card Add $60
* SPEEDSTAR VGA Card Add $60
* RAM Add $40/MB

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"definitely not another 'run of the mill' machine"
"more experienced users searching for top performance might want to consider HD Computers..."

Computer Shopper Magazine June 1991, p240

386-40 MHz 64K Cache
386-33 MHz 64K Cache

* 4 MB RAM Expandable to 32MB Onboard
* 120 MB 18 ms Hard Disk
* 1.2 MB 5 1/4" Floppy Drive
* 1.44 MB 3 1/2" Floppy Drive
* 1:1 Interleaved Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 14" Super VGA Monitor (1024x768) 0.28 dot pitch
* 1 MB 16 bit SVGA Card
* 101-Key Enhanced Keyboard
* Mini Vertical or Desktop Case with Power Supply
* 387 CoProcessor Socket Supports Intel Weitek, Cyrix and IIT CoProcessors
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0
* MS Windows v 3.1

$ 1395

Options:

* 200 MB Hard Disk Add $200
* Non-interlaced Monitor Add $50
* Full Vertical Case Add $50

386-25 MHz

* 4 MB RAM Onboard
* 40 MB Hard Disk
* 1.2 MB 5 1/4" Floppy Drive
* 1.44 MB 3 1/2" Floppy Drive
* 1:1 Interleaved 2FD/2HD Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 14" SVGA Monitor (1024x768) 0.28 dot pitch
* 1 MB 16 bit SVGA Card
* 101-Key Enhanced Keyboard
* Mini Vertical or Desktop Case with Power Supply
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0
* MS Windows v 3.1

$1195

Options:

* 100 MB Hard Disk Add $100
* 200 MB Hard Disk Add $350
* RAM Add $40/MB
* Non-interlaced Monitor Add $50

386SX-33 MHz
386SX-25 MHz
386SX-16 MHz

* 1 MB RAM Expandable to 8 MB Onboard
* 40 MB Hard Disk
* 1.2 MB or 1.44 MB Floppy Drive
* 1:1 Interleaved Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 101-Key Enhanced Keyboard
* Mini Vertical or Desktop Case with Power Supply
* Socket for Math CoProcessor
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0

SX-33 MHz $695
SX-25 MHz $650
SX-16 MHz $595

Options

* 200 MB Hard Disk Add $350
* Second Floppy Drive Add $60
* Windows v 3.1 Add $45
* 12" Amber Monitor with Card Add $95
* 14" VGA Monintor with 16 bit VGA Card Add $295
* 14" SVGA Monitor with 1 MB SVGA Card Add $395
* 14" Non-interlaced SVGA Monitor with 1 MB SVGA Card Add $445

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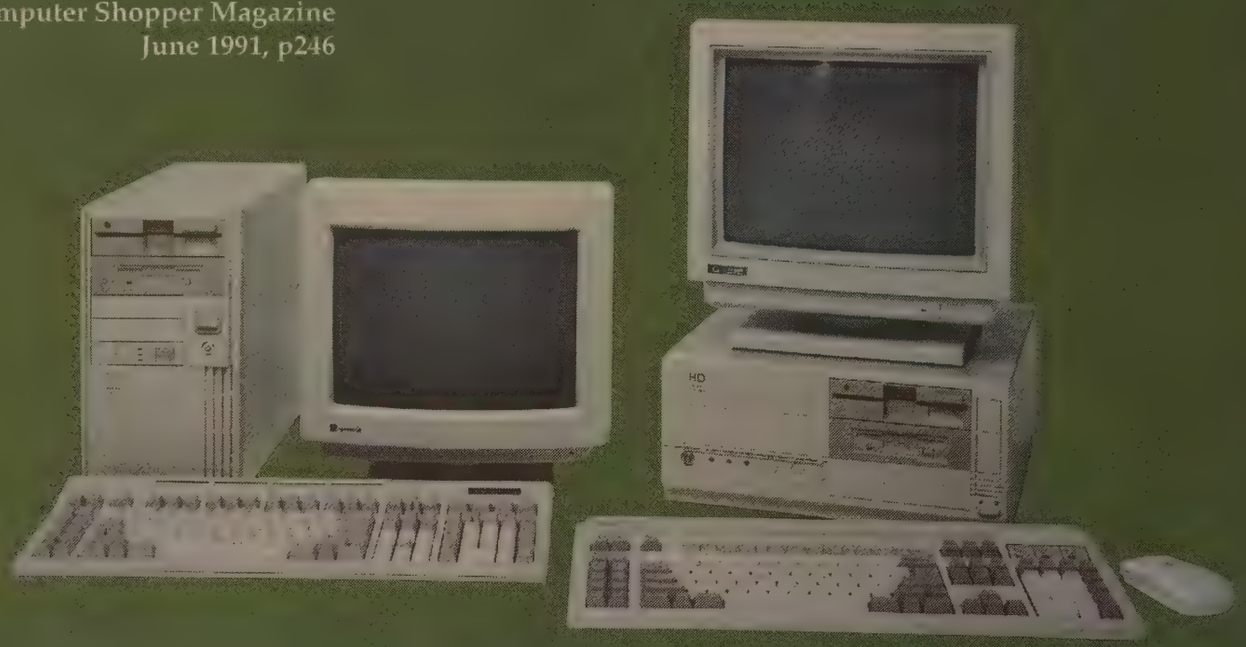
HD: GOOD SYSTEM, GOOD PRICE

Computer Shopper Magazine
June 1991, p246



286-16 MHz

* 1 MB RAM Expandable to 8 MB Onboard
* 40 MB Hard Disk
* 1.2 MB or 1.44 MB Floppy Drive
* 1:1 Interleaved Controller
* 2 Serial, 1 Parallel and 1 Game Ports
* 101-Key Enhanced Keyboard
* Mini Vertical or Desktop Case with Power Supply
* Socket for Math CoProcessor
* Clock/Calendar with Battery Backup
* 8 Expansion Slots
* 3 Button High Resolution Serial Mouse
* MS DOS v 5.0

$550

Options

* 100 MB Hard Disk Add $100
* 200 MB Hard Disk Add $350
* Second Floppy Drive Add $60
* RAM Add $40/MB
* Windows v 3.1 Add $45
* 12" Amber Monitor with Card Add $95
* 14" VGA Monitor with 16 bit VGA Card Add $295
* 14" SVGA Monitor with 1 MB SVGA Card Add $395
* 14" Non-interlaced SVGA Monitor with 1 MB SVGA Card Add $445

386SX-20 MHz Notebook

* 2 MB RAM Expandable to 6 MB Onboard
* 60 MB Hard Disk
* 1.44 MB Floppy Drive
* 640 x 480 VGA LCD Gray Shades Display
* MS DOS v 5.0

$1395

Options

* RAM Add $100/MB
* 80 MB Hard Disk Add $100

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- Shipping charges not refundable
- 1 year parts, lifetime labor warranty
- Free Delivery and 1 Year On-Site Service (For 408, 415 & 510 Area Codes Only)
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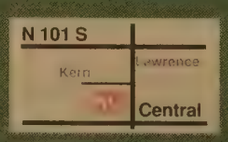
- Prices and specifications subject to change without notice



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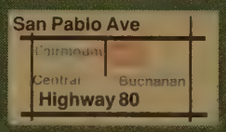

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PRODUCT SPOTLIGHT

Continued from page 196

shows that explain the science behind our solar system. A glossary and index allow access to additional information in text form. An Eclipse Tracker displays a map of the world to show the paths of past, present, and future solar eclipses from 1940 to 2040. Another section features the Anatomy of an Eclipse, explaining what causes eclipses and why they don't happen more often.

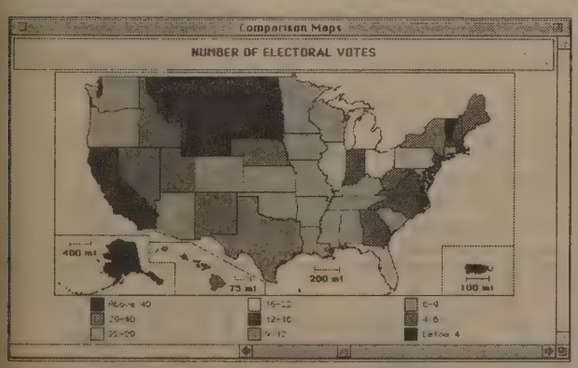
The View From Earth is fun to view, informative, and in most sections fairly technical (just as the Time Life science series is). It requires a color Mac with 4MB of memory to run this CD, and at times waiting for data to arrive from the CD drive gets tedious, but that's mostly a fault of CD-ROM technology in general, and not this product in particular. If you or your children enjoy science education, this is a product worth your consideration. (Warner New Media, Inc., 3500 Olive Ave., Burbank, CA 91505. 818/955-9999)

MACINTOSH SOFTWARE REVIEW

MACUSA

Published By: PC Globe
List Price: $59.95
Reviewed By: Michael Niemann

Quickly, which state of the union has the highest corn production? That's easy, Iowa! How about the state with lowest number of people per lawyer? That's a bit trickier! (But not much.) The answer is New York, with an average of 245 people per lawyer. You can find the answers to these and numerous other questions in MacUSA, published by the people who brought you PC Globe and PC USA.



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BEST BUYS!

386SX-16/25 MHz SYSTEM
- 14" Color VGA
- 16-Bit Card
- 1.2 Teac Drive
- 40 MB Hard Disk
- 1 MB RAM
- IDE Controller
- 2 Ser/1 Par/ 1 Game Port
- 101 Keyboard
- Deluxe Case

$688/708

286-16 MHz SYSTEM
- 40 MB Hard Disk
- 1.2 Teac Drive
- 12" Monitor
- MGP Card
- 1 MB RAM
- 101 Keyboard
- MB & CPU
- IDE Controller
- 2 Ser/1 Par/ 1 Game Port
- Deluxe Case

$498

486DX-33 64K SVGA System
- 80 MB Hard Disk
- SVGA Monitor
- SVGA Card
- IDE Controller
- 2 Ser/1 Par/
- 1.2 Teac FD
- 1 MB RAM Expandable To 32 MB
- 101 Keyboard
- Deluxe Case

$1178

386DX-40 SVGA System w/64K Cache
- SVGA Monitor
- 80 MB Hard Disk
- SVGA Card
- IDE Controller
- 2 Ser/1 Par/ 1 Game Port
- 1.2 Teac FD
- MB & CPU
- 1 MB RAM
- Deluxe Case

$868

BEST BUY
LOCAL BUS MOTHERBOARD MADE IN THE U.S.A.
SUPPORT: NOVELL, NETWORK, AUTOCAD, OS2, UNIX, DOS...

U.S. MADE MOTHERBOARD
- 486DX-33/64K $175
- 486DX-33/256K 205
- 486DX-50/64K 225
- 486DX-50/256K 245
- Slots: 6-16 bit AT Bus : 2-8 bit XT Bus : 1-32 bit Local Bus
- Memory : 32M on board memory

MADE IN U.S.A. 486/33/256K CACHE
Intel 486DX, 4 MB, 2 floppies 130 MB HD, Windows 3.1, 101 keyboard, 1 MB SVGA, IDE+I/O, Mini Tower, 28 monitor, mouse
Free Mouse
$1559

AT I/O (2S, 1P, 1G)	$10	Agiler Mouse	$15
SIMM Memory 1MB	33	Trident 512K	44
Trident 1 MB Video Card	63	Orchid IIs w/1 MB/Sierra	138
Motherboard w/CPU:		Motherboard w/o CPU:	
386 SX-16	$120	386 DX-25/33 MHz	$98
386 SX-25	125	386 DX-25/33 MHz 64K Cache	129

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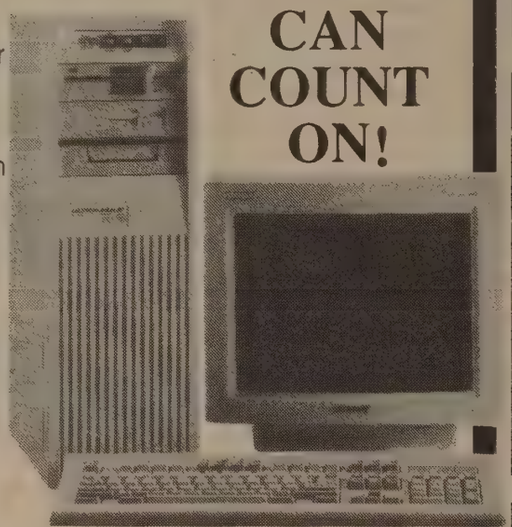
486-EISA 50MHz 256K Cache

DTC EISA SCSI Controller with 512K RAM (4MB maximum)

- ❒ *Intel* 80486DX-50MHz CPU chip,
- ❒ 8K internal Cache, 0 wait state
- ❒ *Weitek* 4167 Co-processor socket
- ❒ 256K fast SRAM Cache on board (20NS)
- ❒ 1MB RAM, Maximum 64MB
- ❒ *AMI* BIOS, *Intel* 82350 EISA chipset
- ❒ Eight (8) 32bit EISA slots
- ❒ *DTC* 3290AS EISA SCSI Cache controller 32bit , with 512K RAM (Maximum 4MB), Data transfer rate 33MB/sec
- ❒ 275 Watt power supply with two cooling fan
- ❒ Full tower case with 7 drives bay
- ❒ *Teac* One 5 1/4" 1.2MB floppy drive
- ❒ *Teac* One 3 1/2" 1.44MB floppy drive
- ❒ Two serial, One parallel & Game port
- ❒ *Focus* 2001 enhanced 101 -key keyboard
- ❒ Landmark 197MHz (V1.14)
- ❒ **Power meter 19.9 mips (V1.5)**

$1999

QUALITY YOU CAN COUNT ON!



Option:

- ❒ Memory upgrade on mother board or controller $40per megabyte (60NS)
- ❒ *Diamond Stealth*VGA card with Accelerator S3 chip,1024K VRAM, 1280x1024, Hi-color, Non-interlaced, *NEC* 4FG 15" multisync monitor, Falt Screen, Non-interlaced $999
- ❒ Trident SVGA card 1024K, 1024x768 resolution, non-interlaced, with ViewSonic 6 non-interlaced montor $459
- ❒ Monochrome graphics card 720x350 resolution with 14" flat screen high resolution (720x350) Amber or paper white sreen $ 115
- ❒ System with UltraStor IDE Cache controller $1999
- ❒ **Hard disk drive list see oppisite page**

486DX-50MHz 256K Cache

Ultrastor 15C Cache controller

Maxtor 210MB hard drive

256K cache RAM, AMI BIOS, 1 MB RAM, ***Ultrastor* 15C** Cache controller W/ 1MB (8MB maximum), Duel floppy drive, TVGA card w/1024K, ***Viewsonic*** 6 14" non-interlaced monitor, One parallel, two serial ports, 275 Watts power supply with two cooling fan, Full tower case with 7 drive bay, Focus 2001 enhanced 101-key keyboard,
Optional: additional memory per megabyte $40 (60ns)

$2295

486-33MHz

64K Cache
1MB RAM

$777

- ❒ *Intel* 80486DX-33MHz CPU, 0 awit state
- ❒ *AMI* BIOS, Co-Processor build-in
- ❒ 64K fast SRAMCache
- ❒ 1MB RAM on board, 64MB Maximum
- ❒ *Teac* 1.2MB or 1.44MB floppy drive
- ❒ Two serial, one parallel, game port
- ❒ *Focus* 2001enhaced keyboard

Conner 210MB IDE hard drive, ***Viewsonic*** V6 Non-interlaced SuperVGA system **$1697**

Conner 210MB IDE hard drive, 14" Hi-res. Mono System **$1377**

386-33MHz

64K Cache
1MB RAM

$399

- ❒ *Intel* 80386DX-33MHz CPU
- ❒ *AMI* BIOS, Co-Processor socket build-in
- ❒ 64K fast SRAMCache on board
- ❒ 1MB RAM on board, 32MB Maximum
- ❒ *Teac* 1.2MB or 1.44MB floppy drive
- ❒ Two serial, one parallel,One game port
- ❒ *Focus* 2001enhanced keyboard

Conner 210MB hard drive, SuperVGA System **$1247**

Conner 120MB hard drive, 14" Mono System **$ 829**

Serving You for over 7 years!
1 Year warranty on parts!
Life-time technical support!

5 years in-store labor warranty!
48 Hour repair turn-around!
30-day refund policy!

TwinHead 486DX-33MHz 80MB $ 2899

- ❒ *Intel* 80486DX-33 MHz CPU
- ❒ *Phoenix* BIOS (128K ROM)
- ❒ 8K internal cache memory
- ❒ 4MB RAM upgradable to 8MB or 20MB

NOTEBOOK

INSTOCK

- ❒ 1.44MB floppy disk drive, 80MB fast 19" hard disk drive
- ❒ One serial, one parallel ports, External monitor, keyboard /keypad and mouse connect , external floppy drive socket, Expansion bus connector and internal faxmodem socket
- ❒ Cirrus Logic's 16-bit GD6410 VGA chipset with 256K, 64 gray shades, 640x480 resolution, supports external VGA monitor for up 800x600, CCFT Super-twist 10", fast response, Paper white LCD screen
- ❒ Auto switching 110/220VAC adaptor with removable & rechargable NiCad battery
- ❒ 84/85 key keyboard, four separate cursor controls, inverted "T" type, Connector for external kebord keypad
- ❒ Weight 6 lbs.(with battery), MS DOS 5.0 w/ Video utilitys & driver automatic power management, Cover close alarm, complete User's menual

Options: 130MB hard drive system $3175, Spare NiCad battery pack $99, 4MB memory module $399, 16MB memory module $1,099, Internal 96/24 FAX / Modem card with MNP5 $295

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VIDEO CARD

Orchid

Fahrenheit	1MB	Hi-Color 1280x1024, Accelerator S3 chip	$ 249
Pro-Designer IIS	1MB	1024x768	169

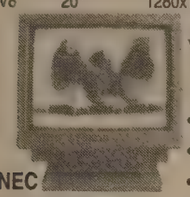
Diamond

Stealth VRAM	1MB VRAM,	1280x1024 , Accelerator S3 chip	269
SpeedStar	1MB ,	1024x768, Non-interlaced	169

MONITORS

ViewSonic

V4E	14"	1024x768 .28	319
V6	**14"**	**1024x768 .28 Non-interlaced**	**359**
V7	17"	1280x1024 Non-interlaced	1099
V8	20"	1280x1024 .31	1699



ViewSonic Non-Interlaced

6 $359

- 14", .28 dot pitch
- 1024x768 resolution
- 72Hz refresh (800x600)

NEC

3FGX/ 4FG/ 5FG			669/749/1399
6FG	21"	1280x1024 .28mm 135MHz bandwidth	2999

Sony

1304S	**14"**	**1024x768 .25 Non-interlaced Low radiation**	**559**
1604S	**17"**	**1024x768 .25 30-57 KHz scan frequency**	**1075**
1791	**17"**	**1024x768 .25 30-57KHz Analog RGB input**	**1029**
1936	20"	1280x1024 .30 Non-int. Low radiation	2499

Panasonic

C1381i	14"	1024x768 .28 IBM/MAC 800x600 Non-int.	329
C1395	14"	1024x768 .28 Non-interlaced	469

DRIVES

Brand	model	capacity	speed	warranty	price
	IDE Hard disk drive				
Conner	CP3000	42 MB	28 ms	1 year	185
Conner	CP30084	80 MB	19 ms	1 year	259
Conner	CP30104	120 MB	19 ms	1 year	319
Conner	CP3204	212 MB	19 ms	1 year	489
Conner	CP3504	510 MB	13 ms	1 year	869
Maxtor	7080AT	80 MB	17 ms	1 year	269
Maxtor	7120AT	125 MB	15 ms	1 year	319
Maxtor	7213A	213 MB	15 ms	1 year	489
Maxtor	LXT-340A	340 MB	15 ms	1 year	569
Fujitsu	M2622T	330 MB	12ms	5 year	879
Fujitsu	**M2623T**	**420 MB**	**12 ms**	**5 year**	**969**
Fujitsu	M2624T	520 MB	12 ms	5 year	1089
	SCSI hard drive				
Conner	CP3544	540 MB	fast	1 year	929
Maxtor	LXT-213	213 MB	15 ms	1 year	549
Maxtor	XT-4170S	158 MB	16 ms	1 year	729
Maxtor	XT-8380S	360 MB	14 ms	1 year	1089
Maxtor	**XT-8760S**	**650 MB**	**14 ms**	**1 year**	**1199**
Maxtor	**PO-12S**	**1.2 GB**	**13 ms**	**1 year**	**1799**
Fujitsu	M2623S	425 MB	12 ms	5 year	Call
Fujitsu	M2263SA	687 MB	12 ms	5 year	1269
Fujitsu	1.2GB	1.2GB	14 ms	5 year	1799

Controller (IDE & SCSI)

UltraStor	15C IDE 0k , 8MB Max.	229
UltraStor	24F SCSI (EISA) 64k buffer, fast SCSI-2 33MB/sec	449
UltraStor	14F SCSI (AT), 64K buffer, Fast SCSI-2 10MB/sec	249
Future Domain	TMC-1680 SCSI-2 (AT), drive 4 floppy	199
DTC	2290 IDE (EISA), drive 3 floppy, 7.1MB/sec	149
DTC	3280 SCSI	129
DTC	3290 SCSI (EISA),	499

PRINTERS

Panasonic

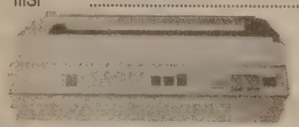
KX-P1123	24 pin	214 cps	80 col		199
KX-P1124i	24 pin	240 cps	80 col		289
KX-P2123	24 pin	240 cps	80 col	quiet	239
KX-P2124	24 pin	320cps	80 col	quiet	349
KX-P2180	9 pin	192 cps	80 col	quiet	159
KX-P1624	24 pin	240cps	132 col		349
KX-P2624	24 pin	300 cps	136col		379
KX-P4410	Laser	5 ppm	512K		629
KX-P4430	Laser	5 ppm	1MB PCL	Scalable...	949
KX-P4455	Laser PS	11 ppm	2 MB	39 ps fonts ...	1695

EVEREX

Abaton laser 6ppm PS 24 fonts PCL4 Apple talk 999

Hewlett Packard

DeskJet	500 / 500C	399/695
LaserJet	**IIP plus / IIIP**	**789/999**
LaserJet	III / IIID	1449/2295
LaserJet	IIISi	3495



EPSON

LQ-570	24 pin	315 cps	80col	269
LQ-870	24 pin	413 cps	136 co	459
LQ-1070	24 pin	315 cps	136col	389
LQ-1170	24 pin	413 cps	136col	599
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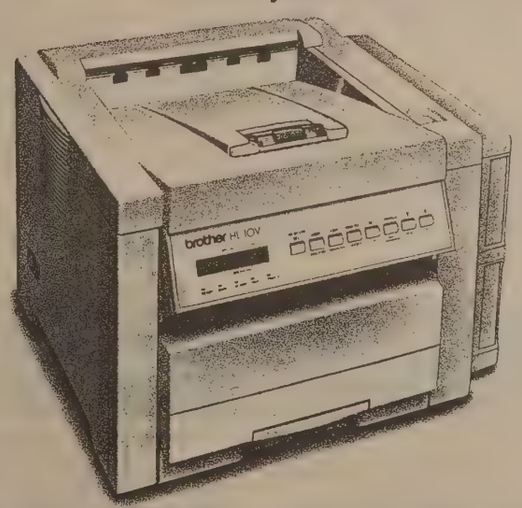

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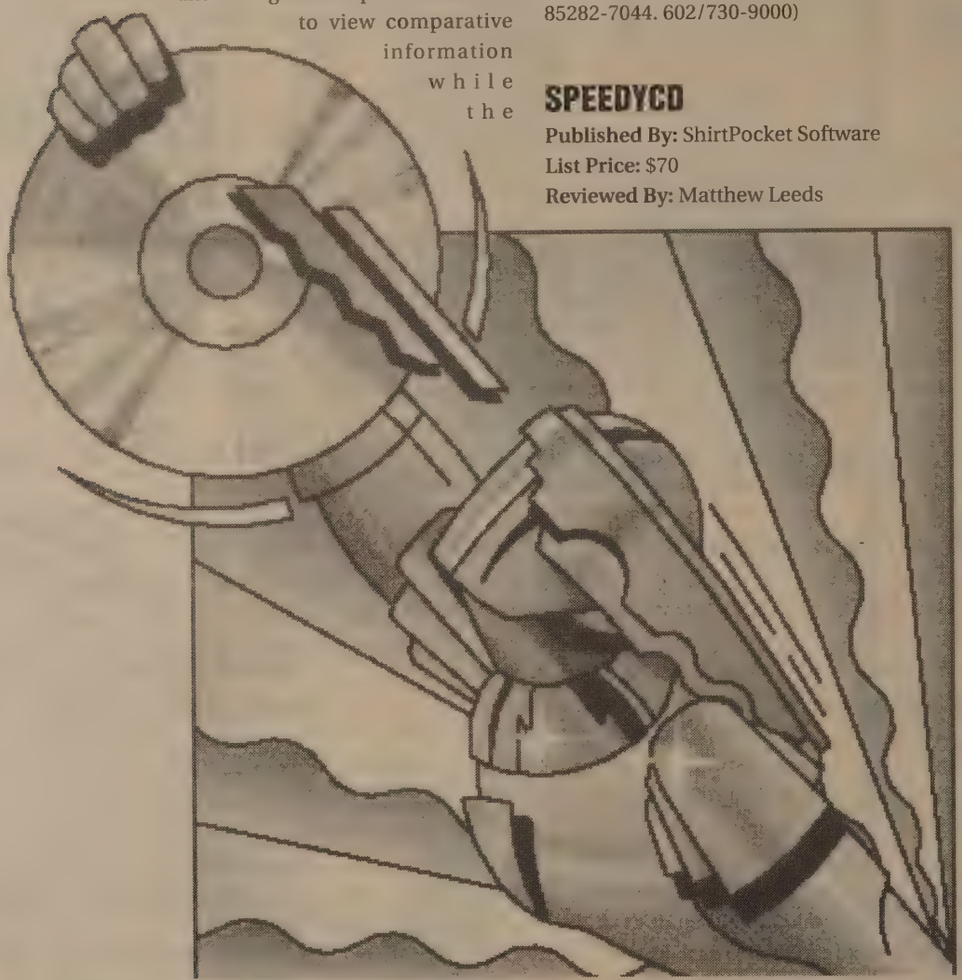
PRODUCT SPOTLIGHT

MacUSA is basically a very large database containing information ranging from the vital statistics of the United States to education; government; the economy; and, as pointed out above, the level of corn production. All of this information (over 150 categories) is organized by state and is accessed and presented using MacUSA's thematic maps or comparison charts.

One may view either the entire US, regional maps, or state maps. The US map and the regional maps allow the user to view comparative information while the state maps provide a close-up view of the physical and other features of the state selected. The latter includes the state flag and the state song. A utility option even provides you with quick access to ZIP codes and area codes while also calculating the distance between cities.

As with all statistical reference works, MacUSA was dated the moment it was published. The company offers annual updates at special prices to registered users, but here is my only complaint: users cannot add their own data to the database. No matter how large the database, there will always be need for even more data. PC Globe should add this option as a further enhancement to an excellent package. (PC Globe, Inc., 4440 S. Rural Rd., Tempe, AZ 85282-7044. 602/730-9000)



SPEEDYCD

Published By: ShirtPocket Software
List Price: $70
Reviewed By: Matthew Leeds

CD-ROM drives are a great success in the Macintosh market. Over two hundred thousand Mac users now have a CD-ROM drive. At some point, all users make the same comment, "Why is the drive so slow?" SpeedyCD doesn't perform miracles, but it does speed up some aspects of CD-ROM usage.

SpeedyCD creates a database of the file and folder information contained on your CDs. It stores this information on your hard drive and uses it for Finder operations like opening a window or finding a file. This speeds up the CD's apparent access times, one of the most painful aspects of CD usage. In addition, it allows modification of the database. This lets you rename, delete, move, and create new files and folders on a CD, and change the view characteristics of windows on the CD.

Nothing in life is free. When you first use a CD, SpeedyCD needs time to build the database for that CD. This generally takes only a few seconds, but CDs that contain thousands of files can take over a minute. The database for such CDs can sometimes be several megabytes. You have the option to have the database for a CD automatically deleted when you eject the CD. You can also opt not to have the database created when you first use a CD. I look at and use lots of CDs, and SpeedyCD has become an important part of my system. (ShirtPocket Software, Inc., PO Box 40666, Mesa, AZ 85274. 602/966-7667)

SOFTAT 2.5

Published By: Insignia Solutions
List Price: $499
Reviewed By: Matthew Leeds

The Macintosh computer often seems to live in its own universe. After all, its got everything you could want: networking, printing, tons of software, a great user interface. But every now and then a different reality intrudes—the Mac is an island surrounded by an ocean of DOS clones running a foreign operating system. There are times when you need—yes,

Continued on page 210

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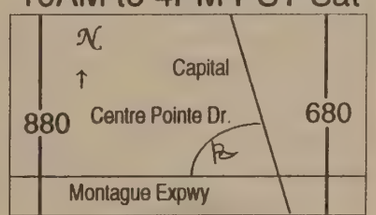

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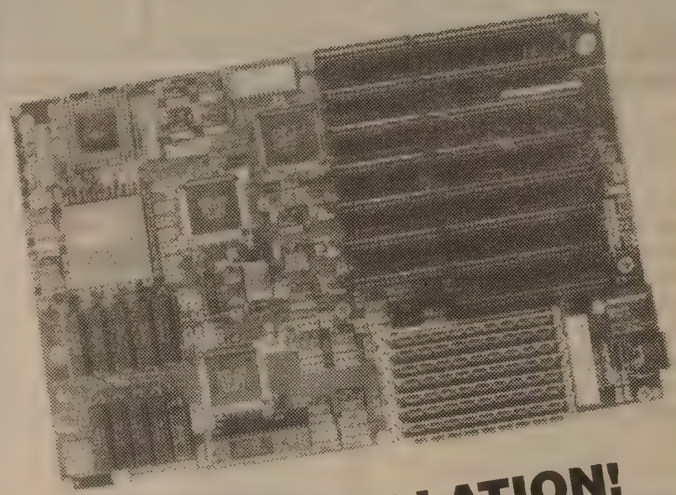

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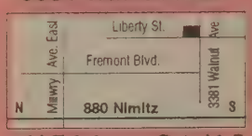

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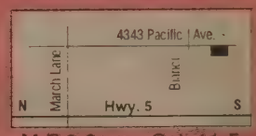

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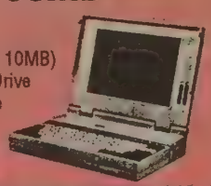

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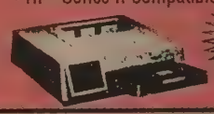

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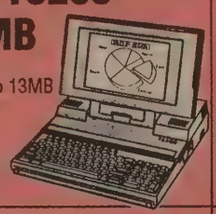

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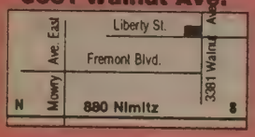

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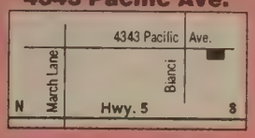

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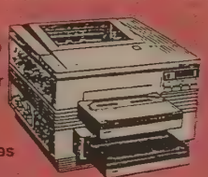

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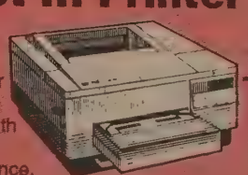

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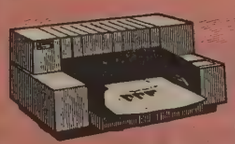

This color printer is ideal if you want primarily black output, but are eager to use up to 16.7 million colors and greyscale in your communications. Its 300 dpi color output rivals that of printers costing three times as much, plus it is networkable and prints on plain paper. Built-in spooling plus Hewlett-Packard's dependable 3 year warranty.

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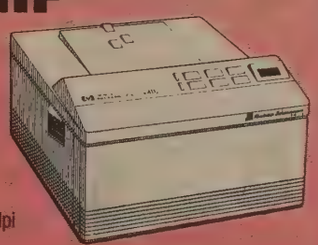

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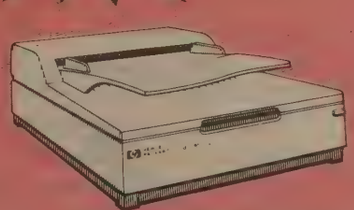

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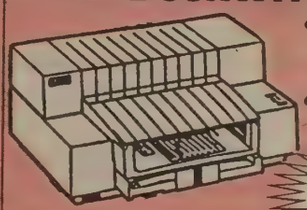

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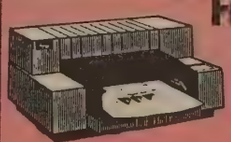

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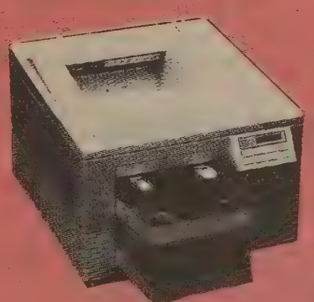

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PRODUCT SPOTLIGHT

Continued from page 204

it's true—to be able to use DOS software. Rather than buying a clone, a copy of Insignia Solutions' SoftPC line of products is much cheaper, and in many cases as far afield as you'll need to venture.

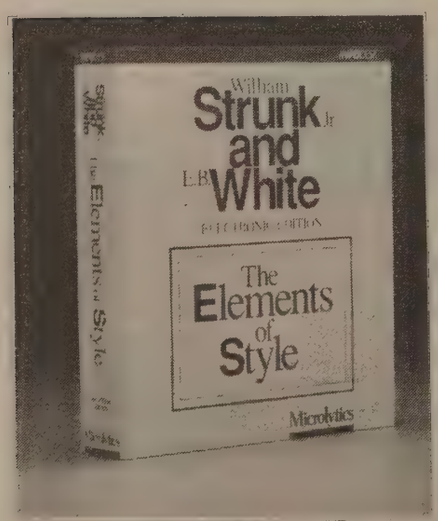
My main interest in things DOS these days is CD-ROM products. There are ten times more CD-ROMs for DOS systems than for the Mac, most full of interesting data accessed with text retrieval engines not yet ported to the Mac. SoftAT now ships with Microsoft's CD-ROM Extensions, required for most DOS CD-ROMs. It's not an ideal solution, but it's the best one I've come across.

SoftAT also supports printing to some DOS printers, improved file sharing, DOS 5.0 compatibility (DOS 3.3 is included), an improved menu structure, and is System 7 savvy. You can read DOS floppy disks and format them in a SuperDrive. SoftAT emulates an EGA display on a color or gray-scale monitor. The serial ports and mouse are fully active, LIM EMS memory is available to 32MB, and 80287 emulation is supported. Insignia also offers a product called SoftNode for Novell NetWare access. Applications don't run as fast under SoftAT as they do on real Intel hardware, but then, it's a fraction of the price. (Insignia Solutions, Inc., 526 Clyde Ave., Mountain View, CA 94043. 1-800-848-7677)

ELEMENTS OF STYLE

Published By: Microlytics
List Price: $59.95 (PC version also available)
Reviewed By: Matthew Leeds

The Elements of Style is a book of instruction on concise writing. Microlytics has converted the contents of E.B. White's classic to a computer reference tool. Third in the INFODESK series, Elements of Style uses the same interface, a desk accessory that provides access to five major categories: elementary rules of usage, elementary principles of composition, a few matters of form, words and expressions commonly misused, and an approach to style. Each category can be accessed in three different ways: the reverse dictionary, outline view, or graphic view.



The reverse dictionary is essentially a search engine. You may enter a word, partial word, or phrase. All of the articles that contain information on your search topic are displayed, you may view any one by double clicking on it. If you wish to browse through the complete text, the graphic or outline views show topics and articles. They also offer a search function.

You can copy any of the information found in your search. This may come in handy to back up an editing decision you make on someone else's work. The copy feature preserves the line length formatting from the program's display window, and uses paragraph returns to mark the end of each line. This generally requires manual reformatting, but as I expect the copy feature will not often be used, it's not a major concern.

There is a help feature included but the program is so easy to use that I doubt it gets much use. Elements of Style will work on any Mac with a hard drive from the Plus on up, and System 6.0 and above. (Microlytics, Inc., 2 Tobey Village Office Park, Pittsford, NY 14534. 1-800-828-6293)

WORD FINDER PLUS

Published By: Microlytics
List Price: $69.95
Reviewed By: Matthew Leeds

If you purchased a copy of Microsoft Word more than a year ago, you've most likely used Word Finder, the thesaurus that was bundled with Word. It was serviceable, but has been showing its age for some time now. The upgraded version, Word Finder Plus, now offers over a million synonyms, auto-inflection technology, and requires less disk space than the original.

Auto-inflection presents the correct grammatical form of a word for concise synonym choices. For example, selecting "thinker" returns synonyms such as "philosopher" while "thinking" returns "contemplating." This cuts the amount of time you must spend sorting through the million plus synonyms. Word Finder Plus, compatible with both System 6 and 7, uses a control panel to change its settings. This was my first problem with Word Finder Plus—it's active all the time, but can't be used from the Finder. If you want to turn it off, you've got to open the control panel to do so. While it can use as little as 30K of memory (in slow mode), it's still a pain.

I also found some compatibility problems. While the manual states that Word Finder Plus is compatible with both Word and Excel, no version numbers are listed. When I tried it with Excel 3 it did not work, and in Word 5 the hot key was not functional. I also ran into init problems that I finally solved by renaming to change the loading order. It did work fine with AppleLink 6.1 and several other applications, but since it can't be used from the Finder, it would not work with Vantage, a DA text editor I use frequently. If Microlytics can get the bugs out, this might be a useful product. (Microlytics, Inc., 2 Tobey Village Office Park, Pittsford, NY 14534. 716/248-9150, 1-800-828-6293)

BOOK REVIEW

THE ENTREPRENEURIAL PC

Author: Bernard J. David
Published By: Windcrest/McGraw-Hill
List Price: $34.95 cloth, $24.95 paper
Reviewed By: Woody Liswood

What a great book—for everything but what the title suggests. Author Bernard David says that this book will give you over one hundred profitable business ideas to help you make a living using your PC. That part of the book is pabulum, and if you can't come up with ideas not in the book, it is time to consider getting rid of your PC so you don't have to face the misery of wondering what to do with it.

However, and this is crucial, there are multiple chapters on starting a business that should be required reading for anyone thinking about starting any business. David presents the entrepreneurial viewpoint very well and offers sound advice.

His description of an entrepreneur is great—someone with a great amount of energy possessing the drive and vision to get the product to market. A chapter on reading financial statements should be read before you even think about starting your business and entering your financial information into Microsoft Money. The discussion about how much money a startup needs and ways of getting that money makes sense to me. But remember, there is no such thing as a free loan, and unless you have been successful doing this before, you probably are not going to get anybody to loan or give you any money.

After the first 225 pages you do get to the one hundred or so ideas for using your computer. This was a distinct letdown. The ideas are old hat, wishy-washy, and do not address what each business is or who should do it. I got the impression that some of these businesses were simply gleaned from looking through computer magazines.

Disturbed by this drawback or not, read this book—just don't read past page 227. *The Entrepreneurial PC* presents an intelligent, comprehensive discussion of the multitude of issues facing the burgeoning entrepreneur. (TAB Books/Windcrest-McGraw-Hill Inc., Blue Ridge Summit, PA 17294-0850. 1-800-233-1128) ■

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MB 386Sx25MHz	$ 130
MB 386DX25MHz	$ 180
MB 386DX33MHz w/64K Cache	$ 225
MB 386DX40MHz w/64K Cache	$ 235
MB 486DX33MHz w/64K Cache	$ 495
MB 486DX33MHz w/64K Cache EISA	$ 888
MB 486DX50MHz w/64K Cache	$ 858
MB 486DX50MHz w/64K Cache EISA	$1350
TP SONIC 386DX40MHz w/64K Cache	$ 565
TP SONIC 486DX33MHz w/64K Cache	$ 885
TP SONIC 486DX50MHz w/64K Cache	$1585

PRINTERS

STAR 9Pins Dot Matrix	$ 140
STAR 24Pins Dot Matrix	$ 265
STAR 24Pins Color DM	$ 305
HP Lazer IIP PLUS	$ 775
HP Lazer IIIP	$ 995
HP Lazer Series III	$ 1445
HP Lazer IIID	$ 2395
HP Lazer III SI	$ 3495
HP Deskjet 500	$ 395
HP Deskjet 500C	$ 679

Harddisk & Floppy Drives

IDE 42MB	$ 165
IDE 52MB	$ 198
IDE 80MB 18MS	$ 256
IDE 105MB 18MS	$ 264
IDE 120MB 18MS	$ 295
IDE 170MB 15MS	$ 365
IDE 213MB 15MS	$ 490
IDE 240MB 15MS	$ 610
IDE 340MB 15MS	$ 795
IDE 510MB 13MS	$ 990
IDE 540MB 12MS	$1190
SCSI 1.2GB	$CALL
SCSI 1.7GB	$CALL
FD Teac 1.2MB	$ 54
FD Teac 1.44MB	$ 54

HD/FL Controller

IDE 2HD/2FD Controller	$ 14
IDE 2HD/4FD Controller	$ 34
IDE 2HD/2FD with 2S,1P,1G	$ 23
ADAPTEC 1542B SCSI	$ 260
Utrastore 12F ESDI w/Cache	$ 168
Utrastore 24F SCSI EISA	$ 457
DTC SCSI Controller	$ 115
AT I/O 2S,1P,1G Ports	$ 15
Serial card or Parallel	$ 10

Monitors

14" IMP SVGA 1024X768 .39	$ 225
14" IMP SVGA 1024X768 .28	$ 265
14" MM SVGA 1024X768 .39	$ 245
14" MM SVGA 1024X768 .28	$ 275
14" CLUB AT 1024X768 .28	$ 340
14" CLUB AT 1024X768 NI .28	$ 380
14" SONY 1304S	$ 540
14" SONY 1604S	$ 990
15" NEC 3FGX	$ 635
16" NEC 4FGX	$ 745
19" NEC 5FGX	$1338
21" NEC 6FGX	$2760

Video Cards

MGP Card	$ 15
SVGA Card w/512K	$ 40
Trident SVGA w/1024K	$ 68
Tsenglab SVGA w/1024k	$ 85
Diamond Speedstar Plus W/1MB	$ 125
Diamond Speedstar HiColor w/1MB	$ 145
Diamond Stealth VRam w/1MB	$ 245
Orchid Pro Is Hi Color w/1MB	$ 148
Orchid Pro Farenheit w/1MB	$ 218

Modem

Modem 2400B Internal	$ 34
Modem 9600B v.32/v.42Bis	$ 289
Modem 2400 & Fax 9600 Int.	$ 69
Modem 9600 & Fax 9600 V.32/42	$ 345

Mouse & Keyboards

Logitec 1st Mouse	$ 37
Mouseman Bus	$ 64
Mouseman Serial PS2/Combo	$ 65
Scanman 256	$ 259
Scanman 256 w/OCR Software	$ 299
Microsoft Bus	$ 85
Microsoft Serial	$ 65
BTC 101 Keyboard	$ 20
MNP 101 Keyboard	$ 45
Maxiswitch 101 Keyboard	$ 45

Case & Power Supply

Baby Desktop w/200W PS	$ 55
Baby Tower w/200W PS	$ 65
Medium Tower w/230W PS	$ 95
Full Tower w/230W PS	$ 120
Maxi Tower w/250W PS	$ 325
Super Tower w/275W PS	$ 495

NoteBook NBA 386SX25 , 2MB , 60MB HD ONLY $ 1380.00

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200,000 hrs. MTBF
5 Years Factory Warranty

SIZE(MB)	TYPE/FORMAT	Size	SPEED	PRICE
330	IDE SUPER FAST	3.5"	12ms	$759
420	**SCSI /IDE SPECIAL**			**$979**
520	**SCSI 2624FA**	**3.5"**	**12ms**	**$1189**
520	**IDE 2624T**	**3.5"**	**12ms**	**$ 979**
670	SCSI	FH	16ms	$1279
670	**ESDI SPECIAL**			**$1099**
1.2Gb	SCSI	FH	14ms	$1799
2.0Gb	SCSI-2	FH	11ms	$2849

Quantum
SuperFast Hard Drives
2 Year Factory Warranty

SIZE(MB)	TYPE/FORMAT	Size	SPEED	PRICE
52	IDE 64K Cache	3.5"x1"	11ms	$Call
52	SCSI 64K Cache	3.5"x1"	11ms	$229
105	SCSI 64K Cache	3.5"x1"	11ms	$349
122	SCSI 256K Cache	3.5"x1"	Fast	$399
122	IDE 256K Cache	3.5"x1"	Fast	$339
240	IDE 256K Cache	3.5"x1"	Fast	$Call
240	SCSI 256K Cache	3.5"x1"	Fast	$689
425	**SCSI/IDE3.5" FAST**		**9ms**	**$949**

Maxtor®
150,000 Hrs MTBF & Quality by Maxtor

SIZE(MB)	TYPE/MODEL	Size	SPEED	PRICE
80	IDE 7080AT	3.5"x1"	17ms	$258
130	IDE 7120AT	3.5"x1"	15ms	$309
130	SCSI 7120SR	3.5"x1"	15ms	$329
213	**IDE NEW 7213A**	3.5"X1"	**NEW**	**$469**
340	**IDE LXT340A**	**3.5"**	**15ms**	**$739**
340	SCSI LXT340SY	3.5"	15ms	$989
535	**SCSI or IDE**	**3.5"**	**12ms**	**$Call**
670	**SCSI XT8760**	**FH**	**16ms**	**$1199**
1.2Gb	**Panther SCSI**	**FH**	**13ms**	**$1649**
1.7Gb	**Panther SCSI**	**FH**	**13ms**	**$2099**

CONNER

SIZE(MB)	TYPE/MODEL	Size	SPEED	PRICE
42	IDE CP3000	3.5"X1"	FAST	$179
120	IDE CP30104	3.5"X1"	19ms	$309
170	**IDE CP30174E**	**3.5"X1"**	**17ms**	**$369**
213	IDE CP3204F	3.5"	16ms	$489
544	IDE CP3544	3.5"	12ms	$1049
540	SCSI-2 CP3540	3.5"	12ms	$1099

KALOK
1 YR. FACTORY WARR

105Mb	**19ms**	**IDE**	**$249**
120Mb	**19ms**	**IDE**	**$269**

WESTERN DIGITAL
2 Yr. Factory Warr.

84	IDE WDAC280	3.5"x1"	17ms	$229
122	IDE WDAC2120	3.5"x1"	17ms	$299
212	**IDE WDAC2200**	**3.5"x1"**	**15ms**	**$489**

MICROPOLIS
5YR. Factory Warranty

SIZE(MB)	TYPE/MODEL	Size	SPEED	PRICE
340	SCSI MC1684	HH	14ms	$1099
340	ESDI-MC1664	HH	14ms	$999
670	SCSI MC1624	HH	14ms	$1299
1.2Gb	**SCSI-2 MC1598**	**FH**	**14ms**	**$1799**
1.5Gb	**SCSI MC1528**	**FH**	**14ms**	**$1999**
1.6Gb	SCSI-2 MC1908	FH	11ms	$2699
2.0Gb	**SCSI-2 MC1548**	**FH**	**14ms**	**$2699**

Seagate

SIZE(MB)	TYPE/MODEL	Size	SPEED	PRICE
420	SCSI /IDE ST1480	3.5"	14ms	$1099
520	fast SCSI-2	3.5"	12ms	$1259
1.2Gb	**Fast SCSI-2**	**3.5"**	**Fast**	**$1999**
338	Wren Runner	FH	10ms	$1099
670	Wren Runner II	FH	11ms	$1449
1.2Gb	Wren 7 SCSI	FH	14ms	$1669
1.6Gb	Elite fast SCSI	FH	Fast	$2399
2.4Gb	Elite II fast SCSI	FH	Fast	$3499

Now!

HEWLETT PACKARD
5YR. Factory Warranty

SIZE(MB)	TYPE/MODEL	Size	SPEED	PRICE
	3.5" SCSI SUPER FAST (formatted)			
310	C2234	HH	12ms	$1039
400	C2235	HH	12ms	$1149
1.2GB	C2247	HH	12ms	$2149
	5.25" SCSI INDUSTRIAL (unformatted)			
1.2GB	C97558	FH	13ms	$1879
1.6GB	C97560	FH	13ms	$2349
2.3GB	C3010	FH	11ms	$3699

CONTROLLER CARDS

SCSI Controllers

Adaptec Kits

1522 16bit 7HD/2FD KIT	$159
1542BK 16bit Bus Master 7HD/2FD	$259
1640 MicroChannel for PS/2 7HD	$339
1740 EISA KIT, 32bit 7HD	$479

PROMISE TECHNOLOGY
<0.3ms Fast, uses regular 256x9, 1x9, 4x9 simms

CACHING 16BIT with 0Mb (up to 16M)	$259

ALWAYS

2000 KIT 16BIT 7HD/2FD easiest to use	$179

Future Domain

TMC850 8Bit	$65
TMC1680 16bit 7HD/2FD	$165
TMC1680 16bit 7HD/4FD full Kit	$249

OTHER SCSI Controllers

DTC EISA 32bit Caching with 512K	$479
Intelligent SCSI Kit 16BIT 7HD/2FD	**$139**
UltraStor 14F (10Mb /sec) FD/HD	**$229**

IDE Controllers

Standard IDE controllers

2FD/2HD controller with Cables	$15
2FD/2HD with 2Serial/1Par./1Game	$25
SMART CONT. with Bios Easy install	$49

PROMISE TECHNOLOGY
<0.3ms Fast, uses regular 256x9, 1x9, 4x9 SIMMS

Caching 0Mb (up to 16Mb) 2HD/3FD	$199
Caching with I/O 4HD/3FD	$229

3.5"-5.25" Bracket Kit Complete..... $ 6.99

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BEYOND THE LIMITS
for MAC, SUN, NeXT, & IBM Comp.

SIZE(MB)	MAKE	WARR	SPEED	PRICE
830MB	TOSHIBA 438FB	3Yr Warr	12ms	$1449
1.0GB	HP C2247	5Yr Warr	12ms	$2149
1.0GB	SEAGATE ST11200N	1Yr Warr	FAST	$1999
1.0GB	Micropolis MC2112	5Yr Warr	12ms	$2049

TAPE BACK UPs

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The BEST Name in SCSI BACK-UP Drives

SIZE(MB)	MODEL/TYPE	SPEED	PRICE
250	**VIPER** SCSI	up to 5Mb/min	$499
	External Unit (SCSI CASE)		$599
525	**VIPER** SCSI	up to 5Mb/min	$699
	External Unit(SCSI CASE)		$799
2.0Gb	**PYTHON** DAT	up to 10M/min	$1199
	External Unit (SCSI CASE)		$1289
SYTOS PLUS	Software for IBM Comp		$99
NOVA BACK	best Backup software		$99
Back-up Software	**for MAC**		$79

Exabyte
8mm SCSI Helical Scan back up Systems.

SIZE	TYPE/MODEL	PRICE
2.2GB	**EXB-8200** Internal	$1839
	External 2.2Gb 8200	$1999
5.0Gb	**EXB-8500** Internal	$2899
	External 5.0Gb 8500	$3099
EXB-10		$2549
Sytos Plus	Back up software for IBM	$99
NovaBack	Back up software for IBM	$99
Mac Backup	-SurfGuard Software	$79

IRWIN TAPE BACKUP
TAPE BACKUP runs off the floppy port

120MB for IBM Comp Internal	**$179**
250Mb for IBM Comp Internal	**$249**

COLORADO
TAPE BACKUP runs off the floppy port

120MB for IBM Comp Internal	**$189**
External 120Mb Full Kit	**$299**
250Mb for IBM Comp Internal	**$253**
External 250Mb Full Kit	**$369**
External Kit with Card and Cables	**$109**

External SCSI Kits
Includes SCSI Cable, Power Supply, 2x drive mounting hardware, and Cooling.

Case for 3.5" & HH SCSI	$99
Basic Case for 5.25" FH	$139
Basic Case for 5.25" FH&HH	$169
HIGH QUALITY FH CASE	$199

COMPUTER CASES

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REMOVABLEs

SyQuest
SCSI, Removable Cartridges

SyQuest Products:

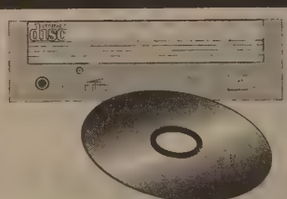
SIZE(MB)	MODEL/TYPE	SPEED	PRICE
44M	**SQ555** Drive	20ms	$299
	External Unit & Cartridge..		$449
88M	**SQ5110** Drive	20ms	$399
	External Unit & Cartridge.....		$589
Cartridges:	**44Mb $69 88Mb**		**$109**
Controller & Software			$ 79

Complete Kits for IBM comp.

INTERNAL KITS include:
Syquest Drive, one Cartridge, Controller, Cables & Software.
44Mb full KIT $419
88Mb full KIT $539

EXTERNAL KITS include:
External Drive, Cartridge, Controller,Cable & Software.
44Mb full KIT $499
88Mb full KIT $619

CD ROMs



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FAST: 325ms Avg. Access Time
SCSI Interface with Audio output

Model 3301B	Internal	$429
External for IBM Comp		$529
External for Mac with CD software		$579
PC Kit :Controller Software & Caddy		$149

NEC
SCSI high-end CD ROM units.

CDR-73 External SCSI 280ms	$589
CDR-74M External SCSI 280ms MPC	$619
CDR-84M INTERNAL SCSI 280ms FAST	$589
Mac NEC Software Kit	$35

CDR-36 EXTERNAL SCSI STARTER KIT
Ext. CD Unit., Cont., Software, 2 Speakers, and 7CDs
IBM COMP. $469 MAC KIT $429

SONY for IBM Compatibles

CD ROM with Controller & GamePack	$339
CD ROM KIT with 5 CD Software Bundle	$449

HITACHI
CDR-1750S External SCSI CD ROM $579
Fast <320ms, 64K Multi-function buffer.

External SCSI Drives

for MAC, IBM Comp., NeXT & SUN
Complete with: High Quality Metal Case, SCSI 50-50 or 25-50 Cable & Software for MAC

SIZE(MB)	MAKE	WARR	SPEED	PRICE
52	Quantum LPS52	2Yrs	11ms	$319
105	Quantum LPS105s	2Yrs.	11ms	$429
125	Maxtor 7120SR	1Yr	15ms	$429
213	Maxtor LXT213Sy	1Yr	15ms	$669
240	Quantum LPS240	2Yr	Fast	$Call
320	Seagate ST4376N	1Yr	16ms	$849
338	Seagate Runner	1Yr.	10ms	$1199
340	Maxtor LXT340Sy	1Yr.	15ms	$989
340	Micropolis M1684	5Yr	14ms	$1199
425	**Fujitsu M2623**	**5Yrs.**	**12ms**	**$1079**
520	**Fujitsu M2624FA**	**5Yrs.**	**9ms**	**$CALL**
670	Fujitsu M2263SA	5Yrs.	16ms	$1469
670	Micropolis MC1624	5Yr	13ms	$1399
1.2Gb	**Maxtor Panther**	**2Yrs.**	**13ms**	**$1849**
1.2Gb	**Fujitsu M2266SA**	**5Yrs.**	**14ms**	**$1999**
1.2Gb	**Seagate ST41200**	**1Yr.**	**15ms**	**$1869**
1.2Gb	**Micropolis MC1598**	**5Yr**	**14ms**	**$1999**
1.5Gb	Micropolis MC1528	5Yrs	14ms	$2199
1.7Gb	**Maxtor Panther**	**2Yrs.**	**13ms**	**$2299**
2.0Gb	Fujitsu M2652SA	5Yrs.	11ms	$3099
2.0Gb	**Micropolis MC1548**	**5Yr**	**Fast**	**$2899**

All other SCSI Drives in this Page can be made External. Please Call for the Best Prices

OPTICAL DRIVES

RICOH
Rewritable Optical SCSI Drives

128Mb 3.5" 45ms FAST

INTERNAL RO-3010E	$1149
EXTERNAL & Cartridge	$1299
Extra Cartridge	$59

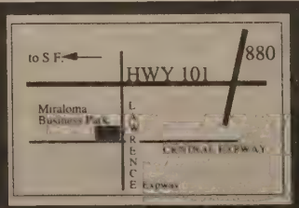
650Mb HYPERSPACE
3600RPM, 35ms SUPERFAST SCSI OPTICAL

INTERNAL RO-5031E	$2399
EXTERNAL & Cartridge	$2749
Extra Cartridge	$CALL

Maxoptix
1Gb Optical rewritable SCSI, 35ms

EXTERNAL Tahiti II (with Cart.)	$3399
1Gb Cartridges Glass	$229

TEAC FLOPPY DRIVES
1.2M $57 1.44Kit $55



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for IBM PS/2, PORTABLES, COMPATIBLES, ...etc.

FEATURING:

* FULL KITS: External SCSI Drive, Fast Parallel Adapter, All Software Drivers Needed, All Cables Needed.
* Daisy Chain any other SCSI Device, for future expansion
* Movable between different computers with parallel ports.
* Auto-Adjust to specific ports.
* Co-resides with internal Hard Drives
* "Pass Through" printer port. Supports Printing as well as Data Transfer.
* Auto Install.
* Free NovaStor Back up software.

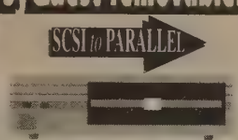
External Hard Drives

Complete with: High Quality Metal Case, Parallel Adapter, Software & Cables - Plug & Play

SIZE(MB)	MAKE	WARR	SPEED	PRICE
52	Quantum	2Yrs	11ms	$499
105	Quantum	2Yrs.	11ms	$619
125	iMaxtor	1Yr	15ms	$619
210	Conner	1Yr	16ms	$829
240	Quantum LPS240	2Yr	Fast	$869
320	Seagate	1Yr	16ms	$1029
340	Maxtor	1Yr	15ms	$1069
340	Micropolis	5Yr	14ms	$1379
425	**Fujitsu**	**5Yrs.**	**12ms**	**$1259**
520	**Fujitsu**	**5Yrs.**	**9ms**	**$1459**
670	Micropolis	5Yr	13ms	$1579
1.2Gb	**Maxtor Panther**	**2Yrs.**	**13ms**	**$2039**
1.2Gb	**Fujitsu M**	**5Yrs.**	**14ms**	**$2179**
1.2Gb	**Seagate**	**1Yr.**	**15ms**	**$2039**
1.2Gb	**Micropolis**	**5Yr**	**14ms**	**$2179**
1.5Gb	Micropolis	5Yrs	14ms	$2379
1.7Gb	**Maxtor Panther**	**2Yrs.**	**13ms**	**$2279**
2.0Gb	**Micropolis**	**5Yr**	**Fast**	**$3079**

All other SCSI Drives in this Page can be made External. Please Call for the Best Prices

SyQuest removables



2 YR. WARRANTY

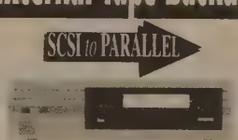
Unlimited Storage. Using Cartridges 44Mb or 88Mb. Fast. Complete with: High Quality Metal Case, Parallel Adapter, Software & Cables & a Cartridge.

SIZE	SPEED	KIT PRICE
44Mb	**20ms**	**$629**
88Mb	**20ms**	**$759**

Extra 44Mb Cartridge $69

Extra 88Mb Cartridge $109

External Tape Backup



Complete with: High Quality Metal Case, Parallel Adapter, NovaStor software, Cables & a Cartridge.

FEATURING: ARCHIVE

The Best Name in SCSI Backup

2 YR. WARRANTY

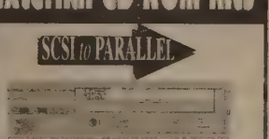
250Mb Viper	**$799**
525Mb Viper	**$999**
2.0Gb Python DAT	**$1499**

FEATURING: **Exabyte**

High End Backup Solutions

2.0Gb EXB 8200	**$2199**
5.0Gb EXB 8500	**$3299**

External CD ROM kits



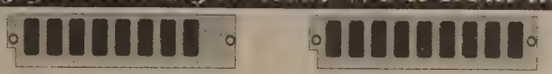
Complete with: High Quality Metal Case, Parallel Adapter, Drivers, Cables & a Caddy.

Toshiba 3301B	**320ms**	**$709**
NEC CDR-74M	**280ms**	**$799**
Hitachi 1750S	**320ms**	**$759**

CHIPS...etc.

MEMORY SIMMS

If you see it for less, We'll Beat it.



TYPE	SPEED	DESC	PRICE
1MBX9	**80ns**	**PC**	**$ 29**
1MBX9	**80ns**	**PC 3CHIP**	**$ 27**
1MBX9	70ns	PC	$ 30
1MBX9	70ns	PC 3CHIP	$ 28
1MBX9	60ns	PC	$ 34
1MBX9	60ns	PC 3CHIP	$ 30
1MBX8	80ns	new MACs	$ 26
1MBX8	**80ns**	**All MACs**	**$ 27**
1MBX8	70ns	new MACs	$ 27
1MBX8	70ns	All MACs	$ 28
2MBX8	**80ns**	**new MACs**	**$ 59**
4MBX9	**80ns**	**PC**	**$99**
4MBX9	70ns	PC	$108
4MBX9	60ns	PC	$119
4MBX8	**80ns**	**MAC**	**$98**
4MBX8	70ns	MAC	$99

MEDIA

TAPES & CARTRIDGES

DESC	1 UNIT	5-PACK
120/250MB QIC 2.7G	$19.95	$90.00
120/250MB FORMATTED	$25.95	$120.00
4mm DAT TAPE 1.2GB	$19.95	$85.00
4mm DAT TAPE 2.0GB	$19.95	$85.00
128 OPTICAL RICOH	$59.00	$280.00
1.0 GB GLASS OPTICAL	$229.00	$1045.00
44Mb SYQUEST CARTRIDGES	$67.00	$320.00
88Mb SYQUEST CARTRIDGES	$105.00	$495.00

CABLES & MISC.

50 Centronics to 50 Centronics	$29.95
50 Centronics to 50 Cent. Rt.	$19.95
Mac 50 to 25 Pin SCSI	$29.95
Sun Centronics to SCSI-II	$39.00
DB50 to Centronics	$39.00
DB50 to SCSI-II	$39.00

INTERNAL CABLES

40 Pin IDE with 3 Connectors	$3.99
50 Pin SCSI 3 Connectors	$4.99
50 PIN SCSI 4 Connectors	$5.99

SPECIALS Of The Month

WESTERN DIGITAL Specials

80Mb IDE	19ms	$129

Seagate Specials

325Mb SCSI	16ms	$699
600MbSCSI	15ms	$999

Maxtor Specials

213Mb IDE	15ms	$469
340MB IDE	15MS	$739
670Mb SCSI	16ms	$1199
1.2GB SCSI	13ms	$1864
1.7GB SCSI	13ms	$2999

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5 Yr Warr

330Mb IDE	12ms	$759
420Mb SCSI	12ms	$979
520Mb IDE	12ms	$979
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AppleLink Opens Up

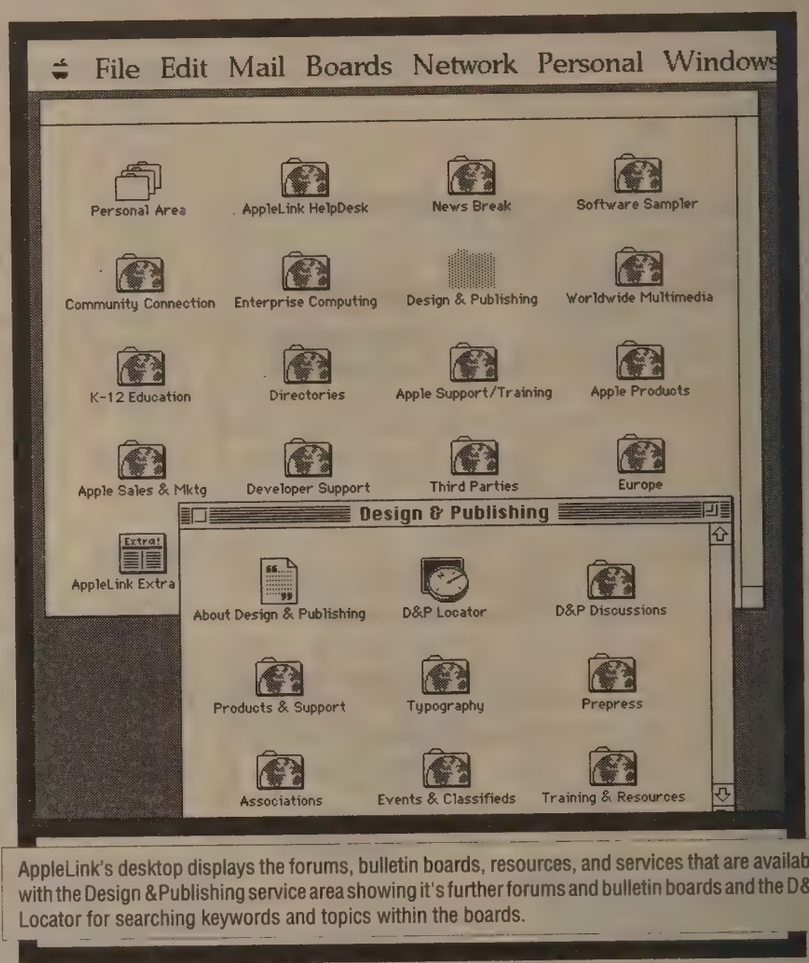
Online Resources For The Multimedia Pro

BY TONY REVEAUX

AppleLink, the online telecommunications system originally designed for the growing internal communication needs of Apple Computer, Inc., had a reputation early on for having—just like the Macintosh—a particularly well-designed and easy-to-use interface. Compared to most of the other electronic mail services in use at the time, AppleLink was a widely admired model. For instance, even in its more recent redesigns, CompuServe's Navigator interface still retains the complexity of a multiplayer version of a Dungeons and Dragons game.

As the installed base of Macs grew by leaps and bounds, a team at Apple began to work on a version of AppleLink that could be marketed to a public user base, one that would enjoy direct connections to many, but not all, of the resources of the professionals' AppleLink. After completing the beta design of a consumer AppleLink, Apple then decided that, as a company, it wasn't quite ready to go into the online service business, and canceled the marketing plan.

But instead of dying an untimely death, AppleLink Personal, as it was then known, reverted to Quantum Computer Services, Inc. (now known as America Online), Apple's partner in the development project. America Online is now one of the more widely used online services, particularly supportive of user needs and interests, and effective at providing industry contacts and resources.



AppleLink's desktop displays the forums, bulletin boards, resources, and services that are available with the Design & Publishing service area showing it's further forums and bulletin boards and the D&P Locator for searching keywords and topics within the boards.

OPEN APPLELINK

Now AppleLink, previously restricted to developers and vendors, is available to all. It is not the largest online service in terms of resources and services, nor is it the least expensive, but if you are in any way involved in the Appleonian Universe of designing, creating, building, serving, connecting, consulting, managing, documenting, fixing, promoting, showing, selling, reselling, repurposing, or reporting on Apple-compatible products, you may find AppleLink a basic necessity.

In today's complex and competitive industry, one increasingly rational and mutually beneficial trend is the growing practice of cross-platform development and implementation. Many people who once worked exclusively in DOS or Windows are now making their products Mac-connectable and/or compatible, and are now talking to Apple as a matter of course—just as the reverse has also become more common. For those of us who haven't spent the last few years building up contacts in Cupertino, AppleLink is helping us get news and product information, not to mention access to other vendors and Apple personnel.

AppleLink may be the best way to reach Apple people in any case. As in every busy company, they are not always near a phone, and since those recent layoffs, many are doubling up on other duties. While AppleLink can't guarantee contact, it enhances your chances of avoiding "voice mail jail."

AppleLink's greatest value is in providing a genuinely worldwide electronic mail dialog network for professionals in many fields who use computers for many things, especially for the industry, K–12 education, design and publishing, and multimedia. If you're a power user, you will almost certainly find AppleLink interesting and valuable, but the average user might do just as well with the lower cost of America Online.

AFFORDABILITY ISSUES: APPLELINK VS. AOL

The one-time start-up fee for an AppleLink

continued on page 218

RESOURCES:

Apple Online Services
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408)996-1010

America Online, Inc.
8619 Westwood
Center Dr.
Vienna, VA 22182
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(703)448-8700

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w/32 BIT EISA SCSI CONTROLLER & 330 MB SCSI HD

SYSPER 486 Systems Include:
- 4 MB RAM/64K/256K Cache
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- 32 Bit ET 4000 Video Card
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- 101 Key Keyboard
- 230 Watt Power Supply
- Baby AT or Mini Tower Case

SYSPER 486 ISA SERIES

w/130 MB HARD DISK & SUPER VGA COLOR MONITOR

CACHE

SX25 w/64K $1039
DX33 w/64K $1255
DX2-50 w/64K $1375
DX50 w/64K $1619

Both DX and SX Series Systems Include:
- 4 MB RAM on Board
- 1.2 MB or 1.44 FDD
- 130 MB IDE Hard Disk
- 16-Bit VGA w/512K
- 14" 1024 x 768 Super VGA Monitor
- 1 Parallel/2 Serial/1 Game Port
- Desktop Baby or Mini Vertical Case
- Math Co-Processor Socket
- Clock/Calendar w/Battery Back-Up

SYSPER 386 SERIES

SX25 ..... $765
DX33 ..... CALL
DX33 ..... $815
DX33 ..... $965
DX40 ..... $845

w/80 MB HARD DISK & SUPER VGA COLOR MONITOR

Both DX and SX Series Systems Include:
- 1 MB RAM on Board
- 1.2 MB or 1.44 FDD
- 80 MB IDE Hard Disk
- 16-Bit VGA w/512K
- 14" 1024 x 768 Super VGA Monitor
- 1 Parallel/2 Serial/1 Game Port
- Desktop Baby or Mini Vertical Case
- Math Co-Processor Socket
- Clock/Calendar w/Battery Back-Up

MONITORS

VIEWSONIC
4E 14" $295
5E 14" 399
6E 14" 335
6PS 15" ..... CALL
V7 17" 1030
V8 20" 1540

MAG
MXT4H 14" .28dp $495
MX14S 14" .26 575
MX15F 15" .28 615
MX17F 17" .26 1175
MX17S 17" .26 ..... CALL

SAMSUNG
SYNCMASTER 3N 14" .31 72 HZ .. CALL
15" .31 72 HZ 495
SYNCMASTER 4+ 17" .31 78HZ .. CALL
SYNCMASTER 5C 17" .26 78HZ . CALL

IDEK
MF5T15 15" .26 ..... $695
MF5217 17" .28 975
MF5317 17" .28 1095
MF5121 21" .31 1775
MF5221A 21" .31 1955
MF5321A 21" .31 2095
MF5421A 21" .26 2354

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9080I 16" .28 ..... $925
F550I 17" .26 ..... CALL
F5060I 17" .26 1875
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T660 20" .31 2425
F750I 21" .31 ..... CALL

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SPEEDSTAR 24 8/16 16M COLORS $180
STEALTH 1 MB 229

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PRO IIs HI-COLOR $145
FAHRENHEIT 1280 215

GEMOA
7900 24 BIT 16M COLORS $175
8800 1 MB 225
8860 1 MB HI-COLOR 235

NUMBER NINE
GXI LITE LEVEL 21 ..... $775
GXI LEVEL 25 1220
GXI LEVEL 24 1285
GXI LEVEL 25 1395
GXI LEVEL 29
24 BIT 16M COLORS 1695

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WONDER XL W/MOUSE 1 MB
HI-COLOR $169
GRAPHICS ULTRA PLUS 1 MB
W/MOUSE VRAM 375
GRAPHICS VANTAGE 1 MB
W/ MOUSE VRAM 255

DIGITIZERS/PLOTTERS

CALCOMP
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33120C/CL 12 X 12 ..... CALL
33180C/CL 12 X 18 ..... CALL
33240C/CL 18 X 24 ..... CALL
33360C/CL 24 X 36 ..... CALL
33480C/CL 36 X 48 ..... CALL

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1212/48C/4CC 12 X 12 48TN ..... CALL
1217/48C/4CC 12 X 17 48TN ..... CALL
XIC 1824 24 X 36 16BM ..... CALL
XIC 2436 24 X 36 16BTN ..... CALL
XIC 3648 26 X 48 16BTN ..... CALL
XIC 4260 42 X 60 16BTN ..... CALL

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CORDED
MM1201 12 X 12 4/16 BTN ..... CALL
MM1812 12 X 18 4/16 BTN ..... CALL
MM0961 6 X 9 4BTN ..... CALL

PLOTTERS
ALL MODELS ..... CALL

HARD DRIVES

CONNER
42 MB $170
85 MB 255
120 MB 295
212 MB IDE 295
212 MB SCSI ..... CALL
540 MB IDE ..... CALL

QUANTUM
52 MB IDE/SCSI $225
105 MB IDE ..... CALL
122 MB IDE 335
210 MB IDE 585
240 MB IDE ..... CALL
425 MB SCSI 975

FUJITSU
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513 MB SCSI-2/IDE ..... CALL
671 MB ESDI/SCI 1275
1.2 GB SCSI 1795
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340 MB ESDI/SCSI $995/1095
670 MB SCSI 1295
1.2 GB SCSI-2 1795
1.5 GB SCSI 1995
1.6 GB SCSI-2 2695
2.0 GB SCSI-2 2695

PANTHER
1.2 GB SCSI $1675
1.7 GB SCSI 2245

WESTERN DIGITAL
85 MB IDE $238
125 MB IDE 290
212 MB IDE 445
212 MB IDE 465

MAXTOR
80 MB IDE $245
80 MB SCSI 280
130 MB IDE 295
130 MB SCSI 325
213 MB IDE 475
213 MB SCSI 535
340 MB IDE 745
340 MB SCSI ..... CALL
535 MB IDE ..... CALL
675 MB ESDI 1295
675 MB SCSI 1215

FLOPPY DRIVES

1.2 MB 5 1/4" $55
1.44 MB 3 1/2" 50
2.88 MB 3 1/2" ..... CALL

TAPE BACK-UP

COLORADO
DJ-10 120 MB INT $185
DJ-20 250 MB INT 250
QFA700 700 MB ..... CALL
IRWIN ..... CALL
ARCHIVE ..... CALL
MAYNARD ..... CALL

MODEMS/FAX

ZOLTRIX
2400 BAUD INT $35
2400 BAUD INT MNP5 49
96/24 SEND & RECEIVE
FAX/MODEM W/MNP5 75
96/24 SEND & RECEIVE
FAX/MODEM W/MNP5 V.42 103
POCKET SEND & RECEIVE
FAX/MODEM EXT 145

ZOOM
96/24 FAX MODEM V.42 BIS
MNP5 INT/EXT $135/155
96/96 FAX/MODEM V.32 BIS
MNP5 INT/EXT 245/265
144/144 FAX/MODEM
INT/EXT 309/329

PRACTICAL PERIPHERALS
PM 14400 FX96 (14.4 MODEM 96 FAX)
V.32 BIS INT $365
PM 14400 FX96SA V.32 BIS EXT 435

US ROBOTICS
COURIER 144 V.32, V.32 BIS, V.42
V.42 BIS MNP5 INT/EXT 535/555
SPORTSTER 96/96 FAX MNP5 EXT 319
SPORTSTER 14.4 V.32 BIS,
V.42 BIS INT/EXT 319/349
SPORTSTER 96/14.4 FAX MODEM
MNP5 INT/EXT 339/359

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8 Bit SCSI Controller	95	95
Other Models	CALL	CALL

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TEL: (510) 651-8002

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Fax: (408) 262-8772

San Carlos
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Fax: (415) 508-0383

SUPER SALE

486-50/64K EISA.....$1,878
486-33/64K EISA.....$1,648
486-50/64K ISA.....$1,598
486DX2-50/64K ISA.....$1,498

- Motherboard w/CPU
- 4MB RAM 70NS
- 1.2MB and 1.44MB FDD
- IDE 2FD/2HD Controller
- AT I/O 2S/1P/1G
- Maxtor 130MB 15NS Hard Drive
- 101-Key Enhanced Keyboard
- 1024•768 .28DPI 14" Color Mon.
- 512K SVGA Card
- Mini Tower or Desktop Case
- 285W Power Supply

Options

- Add $40 for 256K Cache
- Add $40 for Non-Interlaced Monitor
- Add $20 for 1MB SVGA Card
- Add $140 for 200MB Hard Drive

SUPER SALE

486-33/64K CACHE.....$1,338
486SX-25/64K CACHE.....$1,148
486SX-20/64K CACHE.....$1,128

- Motherboard w/CPU
- 4MB RAM 70NS
- 1.2MB and 1.44MB FDD
- IDE 2FD/2HD Controller
- AT I/O 2S/1P/1G
- Maxtor 130MB 15NS Hard Drive
- 101-Key Enhanced Keyboard
- 1024•768 .28DPI 14" Color Mon.
- 512K SVGA Card
- Mini Tower or Desktop Case
- 200W Power Supply

Options

- Add $40 for 256K Cache
- Add $40 for Non-Interlaced Monitor
- Add $20 for 1MB SVGA Card
- Add $140 for 200MB Hard Drive

SUPER SALE

386-40/64K CACHE.....$948
386-33/64K CACHE.....$938
386DX-25.....$918
386SX-25.....$828

- Motherboard w/CPU
- 4MB RAM 70NS (2MB for SX-25)
- 1.2MB and 1.44MB FDD
- IDE 2FD/2HD Controller
- AT I/O 2S/1P/1G
- 80MB 15NS Hard Drive
- 101-Key Enhanced Keyboard
- 1024•768 .39DPI 14" Color Mon.
- 512K SVGA Card
- Mini Tower or Desktop Case
- 200W Power Supply

Options

- Add $20 for 1MB SVGA Card
- Add $40 for .28DPI SVGA Monitor
- Add $50 for 120MB Hard Drive
- Add $200 for 200MB Hard Drive

NOTEBOOK COMPUTER

486DX-33/4MB RAM/120MBHD
$2,698

486DX-33/4MB RAM/80MBHD
$2,498

386DX-33/4MB RAM/100MBHD
$2,048

386SX-25/4MB RAM/120MBHD
$1,698

386SX-25/4MB RAM/80MBHD
$1,498

386SX-25/2MB RAM/60MBHD
$1,278

Features

- 1.44MB Floppy Drive
- VGA 640x480 Resolution
- DOS 5.0
- Serial & Parallel Port
- Please Call for Details

TERMS AND CONDITIONS

1. One year parts and labor warranty.
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3. Prices and availability subject to change w/o notice.
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SYSTEM	[illegible]	BARE SYSTEM	BASIC SYS [illegible] + 12" MONO & MGP CARD	BASIC SYS [illegible] + VGA CARD & MONITOR	BASIC SYS [illegible] + SVGA CARD & MONITOR	BASIC SYS [illegible] + SVGA CARD & MONITOR	BASIC SYS [illegible] + SVGA CARD & MONITOR	BASIC SYS W/4MB RAM [illegible] +130MB HDD +SVGA CARD & MONITOR	BASIC SYS W/4MB RAM [illegible] +200MB HDD +SVGA CARD & MONITOR
486DX-50C EISA	$958	$1,128	$1,380	$1,510	$1,540	$1,600	$1,660	$1,820	$1,970
486DX-33C EISA	728	898	1,150	1,280	1,310	1,370	1,430	1,590	1,740
486DX-50C ISA	688	858	1,110	1,240	1,270	1,330	1,390	1,550	1,700
486DX2-50C ISA	588	758	1,010	1,140	1,170	1,230	1,290	1,450	1,600
486DX-33C ISA	418	588	840	970	1,000	1,060	1,120	1,280	1,430
486SX-25C ISA	196	366	618	748	778	838	898	1,058	1,208
486SX-20C ISA	176	346	598	728	758	818	878	1,038	1,188
386DX-40/64C	176	346	598	728	758	818	878	1,028	1,188
386DX-33/64C	170	340	592	722	752	812	872	1,022	1,182
386DX-25	144	314	566	696	726	786	846	998	1,156
386SX-25	102	270	522	652	682	742	802	962	1,112
386SX-16	96	262	514	644	674	734	794	954	1,104
286-20	72	228	480	610	640	700	760	940	1,090
286-16	62	220	472	602	632	692	752	932	1,082
286-12	49	210	462	592	622	682	742	922	1,072

BASIC SYSTEM CONFIGURATION:
Motherboard & CPU, 1MB (512KB for 286 systems) memory installed, 1:1 2HD/2FD controller, 1.2MB or 1.44MB Floppy Drive, Internal Clock/Calendar, Mathematical Coprocessor Socket, Ennance Case with Power Supply, and 101-Key Enhanced Keyboard.

VIDEO OPTIONS

12" Mono monitor w/MGP card.....$86
14" Mono monitor w/MGP card.....100
14" VGA monitor w/16-bit VGA card 216
14" SVGA monitor with 512k card.....256
VGA-256K (800•600, 16-Bit).....28
VGA-512K (1024•768, 16-Bit).....38
1M SVGA card (1024•768•256).....58
Diamond Speed Star Plus w/ 1MB 126
Diamond Speed Star w/ Hi-Color.....138
Diamond Stealth VRAM 220
Diamond Hi Color & SONY 1304S 684
Diamond Hi Color & Nanao 9070U 940
Orchid Fahrenheit & Nanao 9080i 1,142
Orchid IIs w/ 1MB (w/SYS).....126
Orchid IIs/Hi-Color (w/SYS).....138
Orchid Fahrenheit (w/SYS).....208
ATI Graphic Vantage w/Mouse.....238
ATI Graphic Ultra w/ Mouse 368
Nanao 9080i (16", 1280•1024, 0.28).....924
Nanao F550i (17", 1280•1024, 0.28) 1,032
NEC 3FGX (15", 1024•768, 0.28) 638
NEC 4FG (15", 1024•768, 0.28) 738
NEC 5FG (17", 1280•1024, 0.28) OEM...1,328
MAG 15H (15", 1280•1024, 0.28) 612
Sony CPD 1304S.....548
Sony CPD 1604S 1,034
IDEK MF-5217 (17") 980
IDEK MF-5317 (17").....1,098
HITACHI CM-2085M+ (20") 1,458
HITACHI CM-2187M (21") 2,288
TOSHIBA P17CS01 (17") 1,234
TOSHIBA P21CM00 (21") 2,034
14" VGA Mono Monitor 114
Standard VGA (640•480) Monitor 0.51.....188
Super VGA (1024•768) Monitor 0.39 218
Super VGA (1024•768) Monitor 0.28 258
Super VGA Non-Interlaced Monitor 0.28 ..292
Viewsoic 4E/5E/5+ .....294 / 394 / 494
Viewsonic 6E.....334
Viewsonic 7 1,024
Viewsonic 8 1,524

HARD / FLOPPY DRIVE ADAPTERS

IDE 2FD/2HD.....$13
IDE 2FD/2HD with 2S/1P/1G 18
MFM 2FD/2HD 28
Ultrastor ESDI w/32K Cache (ISA) 154
Adaptec SCSI 1542KB w/Kit (ISA) 248
Bustek SCSI (EISA) 334
Ultrastor SCSI 24F (EISA).....448
Ultrastor ESDI 22F (EISA).....448

PRINTERS

Citizen 200GX (9-Pin).....$154
Citizen GSX-130 (24-Pin).....254
Citizen GSX-140 Plus (24-Pin) 318
Citizen GSX-145 (24-Pin).....388
Color Option for Citizen Printer .....48 / 68
Panasonic KX-P1180 154
Panasonic KX-P1123 200
Panasonic KX-P1124i.....281
Panasonic KX-P1624 344

KEYBOARDS

101 Enhanced Keyboard $20
Maxiswitch / Keytronics.....30 / 36
Focus 2001 / 8000 / 5001 .....40 / 62 / 68
Omnikey 101 / 102 / Ultra .....68 / 68 / 98

MATH COPROCESSORS

AMD 80287-10.....$44
Intel 387SX-25 / 20 / 16 98
Intel 387DX-33 / 25 /20 / 16 98
CYRIX 387DX-40 / 33 .....128 / 98
CYRIX 387SX-25 / 20 / 16.....88 / 82 / 78
IIT 387DX-40 / 33.....128 / 98
IIT 387SX-25 / 20 / 16 .....88 / 82 / 78

NEW HARD DRIVES

40mb/28ms (IDE) $166
52mb/19ms (IDE).....188
80mb/18ms (IDE).....228
100mb/18ms (IDE).....258
120mb/16ms (IDE).....284
130mb/15ms (IDE).....294
200mb/16ms or 240mb/15ms (IDE) 438/558
200mb/16ms (SCSI).....564
340mb/15ms (IDE).....698
676mb/16ms (SCSI).....1,178

MISCELLANEOUS

AT I/O (2S/1P/1G) $11
Windows 3.1 with Mouse 58
Windows 3.1 38
Internal Modem 2400 Baud.....33
Internal Modem 9600 Baud 238
Fax Modem (9600 Fax, 2400 Modem).....56
Fax Modem (9600 Fax, 14,400 Modem) ...298
3-button Mouse 14
Logitech Mouseman Serial/Bus 63/63
Colorado Tape Backup 120mb.....182
Colorado Tape Backup 250mb.....234
ATI Sound Card Pro.....146

HOURS: Monday - Friday: 8am to 6pm
Saturday: 10am to 4pm

Phone (408) 262-8688
1558 & 1562 Centre Pointe Drive
Milpitas, CA 95035 Fax (408) 262-8772

HI-TECH USA

Phone (415) 508-8688
9618 Industrial Road
San Carlos, CA 94070 Fax (415) 508-0383

account, along with the AppleLink software and documentation, is $70 (plus applicable sales tax). The hourly connect fee is $12 an hour.

In addition to the hourly connect fee, you will be billed for the amount of information you access while connected to the network. Information access is measured in kilocharacters (KCs). One KC is equivalent to 1000 characters. Any time you send or receive information between your computer and the AppleLink network, you will incur a KC charge. The KC fee during prime time (weekdays 6 am–6 pm Pacific Standard Time) is $0.055 per KC. The non-prime time (weekdays 6 pm–6 am Pacific Standard Time) KC fee is $0.045 per KC. That includes all day on weekends and designated holidays. The minimum monthly AppleLink charge is $12 per month—which won't be hard to exceed. For instance, last month my prime time time was 24 minutes ($4.80), during which time the data stream was measured as 46 KC ($2.53), giving me a prime time billing total of $7.33.

In comparison, America Online has no start-up fee and the software is free— at least at this time. AOL engages in different promotional programs from time to time, and so deals may differ.

At present, if you're a Mac user, you pay a $5.95 per month "membership fee," with your first month's fee waived. Your first hour of evening/weekend usage each month is included in the charge. Connect time is billed in one-minute increments. You are charged $4 per hour at all times. During the daytime on weekdays, you are charged an additional $4 per hour communications surcharge, for a total of $8 per hour. (This is a 20% discount off the normal hourly rates.) The What's New & Online Support department is free during evening and weekend hours. Usage during the daytime on weekdays is charged at the reduced rate of $4 per hour. AOL also has parallel online services for Tandy, MS-DOS, and PS/1 users, which share some areas; email can be exchanged among them all.

In AOL's Macintosh Communications Forum, you can join in sessions of the Apple Professional Exchange. It is for consultants, end-users, resellers, or for those of you who "just want to have some fun." But while it is indeed fun, it is also at least one step removed from the direct pro-on-pro contact "Juice" that AppleLink provides.

FORUM AND FUNCTION

AppleLink has an easy-to-use interface that encourages you to explore and contribute to its discussions, news, and exchange bulletin boards; the Bulletin Board Pathfinder is a built-in search engine that can help speed your way through the buzz. AppleLink has most of the communications functions that you would want, such as a log-on/mail-check/log-off command, automatic mail, repeating connection for automatic sending and retrieving of email, and a cleanly designed address book. Two of the features that I appreciate the most are the data compression/decompression function, which compresses files—or even folders of files—into expandable "packages," and the program's ability to send and receive formatted files in applications that you may not have on your desktop, and open them in AppleLink. This includes image files.

The Design & Publish service area is the pilot interest group for the new public

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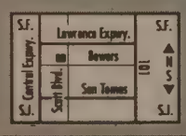

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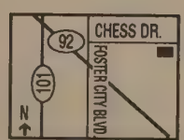

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AppleLink, and it represents a very valuable professional resource. It is not unusual to obtain information and advice that would add up to quite a lot in outside consultant's fees. True, AOL, The WELL, and Ziff-Net also have very lively forums on just about every medium you can think of. The difference is that while there are valuable insights to be had, you must be willing to cut through a lot of friendly and well-meaning cracker-barrel chatter to get it—and it may simply not be there. AppleLink's World Multimedia service area is beginning to get rolling, too.

A word about third-party company forums and boards as information publishers: If you have read one company's bulletin board and found it brim-full of hot scoops before they have even reached *MacWEEK*—and then gone to another company's board, only to discover that the last entry was dated two months ago—that isn't necessarily the sign of deadware. Very often, a company's board is the result of one person's enthusiasm and interest. When he or she leaves, moves to another position, or gets locked into a production deadline, there isn't always someone else there to take over.

More companies are subcontracting their boards to telecommunications professionals. Apple Online Services is launching a new information publishing program designed to expand publishing opportunities for third-party companies on AppleLink. To encourage new signups, AOS is eliminating bulletin board, discussion board, and library fees previously associated with being an information publisher.

There is no equal to the developer services, Apple software updates, third-party demos and updates, the Tech Info Library, and Apple public relations and marketing resources that are instantly available through Applelink. It also includes the Redgate Macintosh Registry of products, but I still prefer Redgate's CD-ROM version.

One area in AppleLink that goes beyond just words is international connections. For any individual or startup that wants to look into foreign marketing and conversion, for instance, there is a wealth of contact resources here, with more being added all the time. One that I found particularly profound is the AGE—Apple Global Forum. There are schools from all over the world that are registered and can participate in exchanging information and resources. Since AppleLink permits sending and receiving files, the schools are trading HyperCard stacks, stories, and graphics. By the time I got to the end of the description and comments of a teacher in Costa Rica, for instance, I felt I could really see the school, and knew what was important to him and his students. If I were still teaching, I'd like to teleconnect my class to them.

INTERNET

The glowing promise of a nation—yea, a world—interconnected by a humming, silvery web of sentience in the form of universal electronic mail has yet to be realized. The reason is that the online services were created— and have been running— as incompatible, separate, and autonomous systems. The telecom landscape has looked like the crazy quilt of independent telephone companies that operated in the early part of the century.

Both Apple Online Services (AOS) and AOL have recently announced their joining with

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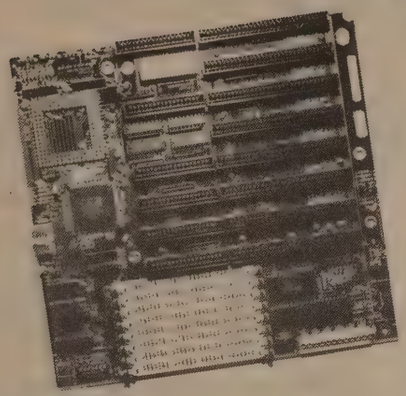


486DX/SX NONCACHE(AR425)

Comparison Table

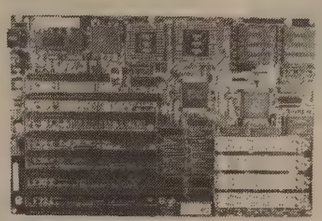
Software	Version	386-40	486SX-25	Unit
Power Meter	I1.7	8.6	11.1	MIPS
Landmark	V1.14	64.9	113.2	MHz
Checkit	V3.0	9747	12054	Dhystones
Qaplus	V4.52	11379	15172	Dhrystones
Cache Size		64K	0K	Byte
Cost With CPU *		$175	$175	USD

* Estimated in July

Let's talk about boards,

486DX-50(AT450)

CPU:80486-50
CHIPSET:SIS
CACHE:64/128/256/
512KB/1MB
BIOS:AMI
BOARD SIZE:BABY
SLOTS: 8

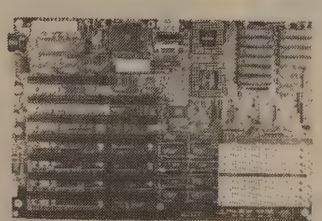


486DX-33;SX-25/ 20(AT433)

CPU:80486DX2-50/66
CHIPSET:SIS
CACHE:64/128/256/
512KB/1MB
BIOS:AMI
BOARD SIZE:BABY
SLOTS: 8

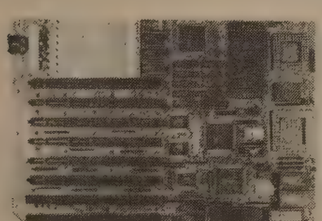
386DX-40/33/25(FU333)

CPU:80386-40/33/25
38605-40/33/25
CHIPSET:CHIPS AND TECH.
CACHE:64/128/256/
BIOS:AMI
BOARD SIZE:BABY
SLOTS: 8



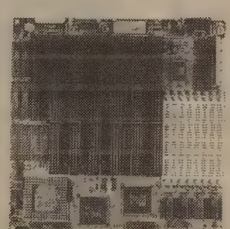
386DX-33/25(FS333)

CPU:80386-40/33/25
CHIPSET:SIS
CACHE:64/128/256/
BIOS:AMI/AWARD
BOARD SIZE:BABY
SLOTS: 8



486-50/33 EISA(AE4)

CPU:80486-50/33
CHIPSET:SIS
CACHE:64/128/256
BIOS:AWARD
BOARD SIZE:BABY
SLOTS: 8



486DX-50/33;486SX-25/20(AX4)

CPU:80486DX2-50/66
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CACHE:64/128/256/
BIOS:AMI/AWARD
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SLOTS: 7

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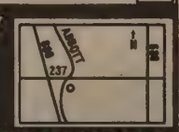

the Internet "gateway" system. The Internet is a collective name for over five hundred thousand networked host computers on thirty-five hundred networks located throughout the world. Internet host computers serve as access points connecting individuals, organizations, and other networks to information services and electronic mail. Some other Internet members are CompuServe, MCI Mail, AT&T Mail, and Sprint Mail.

Internet is the first gateway service Apple is making available commercially. Others are planned for later this year. AppleLink users are billed a 50¢ surcharge for each message sent or received through the

For those of us who haven't spent the last few years building up contacts in Cupertino, AppleLink is helping us get news and product information, not to mention access to other vendors and Apple personnel.

AppleLink/Internet mail gateway. If you wanted to send a message from your AppleLink account to someone on AOL, you would find that AOL's address on the Internet system is "aol.com." But so far, most Internet dialog is meant for text-only messages, and you can't count on being able to transfer documents. Don't expect the quick turnaround you get within your host service; sometimes it can take up to three days between Internet addresses. Nor can you expect to go in and "use" each other's service features the way you can from within your host interface.

But just as online services like AppleLink and AOL are getting better and better, gateways like Internet are an open hope for us all to become truly "wired" as dwellers in a Global Village.■

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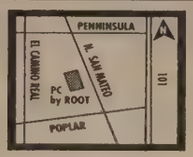

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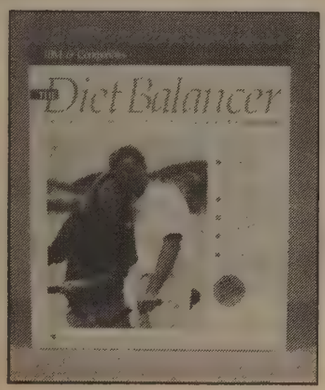

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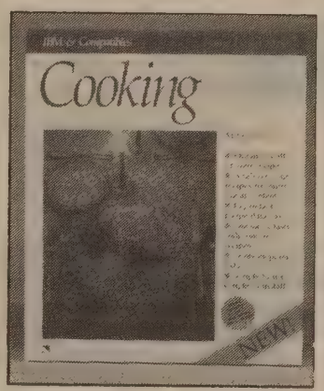

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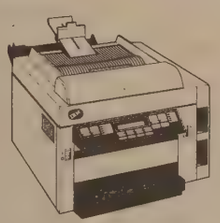

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3D Studio Version 2

Autodesk's Powerful Tool For Desktop Animation

BY ERNEST R. TELLO

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Autodesk's 3D Studio is a professional animation and modeling tool for desktop computers, allowing photorealistic rendering of three-dimensional animated scenes with real-time playback.

Its latest release is lavish with new features that make it indispensable for those who want to push the multimedia capabilities of their desktop machine to the limit. And to help users get off to a flying start with the new reworked edition of this spectacular animation tool, Autodesk includes a CD-ROM packed with hundreds of megabytes of graphics and animation goodies, ranging from ready-to-use 3-D models to texture maps for environmental and background details (e.g. clouds, and wood or marble finishes), as well as a host of impressive animations to demonstrate what 3D Studio can do.

Version 2 adds some new capabilities to the original release:

•There are "Boolean" operations—Union, Subtraction, and Intersection—that allow you to automatically add and subtract 3-D geometries to create more complex meshes.

•You can have a list of several bitmaps to use as different backgrounds in the same animation.

•You can view high-res animations compatible with Autodesk's Animator Pro right from within the 3D Editor or Keyframer.

•Loading .DXF files from AutoCAD for creating architectural walkthroughs is greatly improved.

•There are four types of add-in external process programs now supported, some examples of which are included, for doing automatically what cannot feasibly done interactively, such as producing particle storms, starfields etc.

AN OVERVIEW

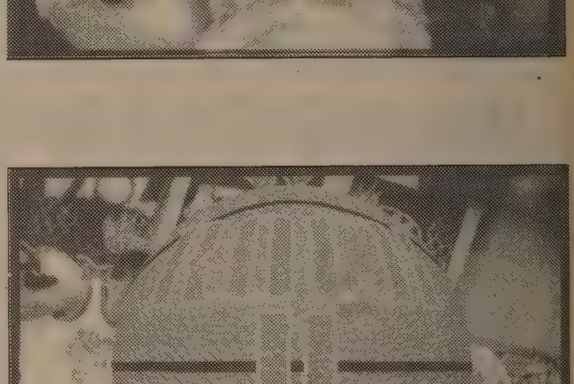
There are three main components to 3D Studio: the editors, the Renderer, and the Keyframer.

The Renderer takes models of 3-D geometry, lighting, and textures, and renders them as projected images on 2-D viewing surfaces, such as your monitor or a printout from your printer.

The Keyframer is the tool you use for creating animations, once you have a model. It automates a good part of the process, so that you do not have to handcraft every frame. The best way to see how this works is to quickly go through the various steps of creating animations with 3D Studio.

Of course, first you have to acquire or develop one or more 3-D models, or "meshes," as they are called in this program. These are the complex wireframes that define any object's three-dimensional geometry. If you lack the desire or time to create your own, they can be imported as .DXF files from AutoCAD and other CAD packages, or purchased from third-party developers.

Next, you might have to partition one or more large objects into several sub-objects, the parts that have the ability to move independently as required for your animation. For example, if your model is a bicycle, then you would probably want to subdivide or separate the two wheels so that the bike frame doesn't rotate with them.



Next, you would want to create linkages between the sub-objects so that the assemblies move as a whole. So, using linkages, you can make a bicycle's wheels and chain move as they should when you rotate the pedal assembly.

Then you would probably want to assign materials to the bicycle's components to give them color and the optical features that determine how they look when lights shine on them from different directions. You can create several of these light sources for animations, combining both omnidirectional lights and spotlights.

Then, place the cameras in their desired starting positions. Cameras define the viewpoint for what the animation screen will show in each frame.

In a sense, it is in these preparatory stages, producing the movement by generating the

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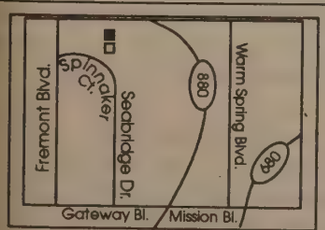

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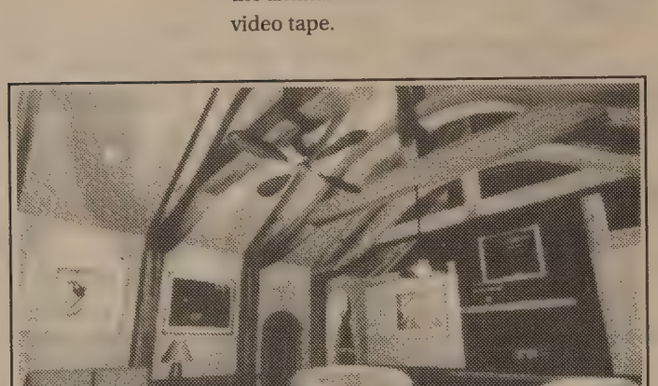
various frames of the animation, that your real skill and ingenuity as an animator are demonstrated.

After all the frames of your animation have been completed, either one or two steps remain, depending on what your target medium is: first, rendering the model to an animation file, and then, if needed, recording the animation to a distribution medium like video tape.



The enormous difference between making frame movements by moving whole assemblies of objects at once, rather than each one individually, cannot be overemphasized.

3D EDITOR

Usually you'll begin preparing an animation in the 3D Editor, which is quite a bit more than a mere editor of 3-D objects.

It can automatically generate many different three-dimensional shapes, such as spheres, toroids, cubes, cylinders, cones, etc. But the 3D Editor includes all the facilities you need to "make a scene," letting you create not only a cast of 3-D animation characters, but all their props and settings. It also has the tools for easily positioning all these objects where you need them.

A particularly important group of commands in the 3D Editor are the detach commands. They let you perform such functions as creating unusually shaped objects by subtracting sections from more symmetrical existing ones, and articulating large complex objects into named subcomponents.

For providing visual richness with the minimum of pain, an important feature of the 3D Editor is its ability to apply texture maps to the surface of 3-D objects. Four types of geometry for texture mappings are provided: planar, cylindrical, spherical, and lofted, all of which can be used with objects of any shape. Their difference lies in the coordinates used by the mapping.

A good way to see the difference is to compare planar, cylindrical, and spherical mapping onto a cube object. A planar map can only project an image onto one of the sides of the cube. A cylindrical map, however, knows how to map around corners of the cube, but only around one axis. With a spherical map the image can turn corners around two axes, which means that it can be made to wrap around the whole cube if you like. Lofted mapping produces a result a little like wallpaper, but projected onto lofted 3-D shapes.

Besides props and scenery, the 3D Editor also allows you to assign backgrounds to scenes. The available choices for backgrounds are virtually unlimited, since in addition to automatically generated solid colors and gradients, you can also use custom bitmap files.

You can construct the other essential elements for your scenes, such as lighting and camera views, in the 3D Editor. You use light definition dialogs to assign RGB color components to lights, as well as luminance, hue, and saturation values. With spotlights, you can also set values for hotspot angle, falloff angle, show cone, and shadow. The camera definition dialog provides a choice of ten different stock lenses or assigning a custom focal length value.

You can also select the field of view (FOV) and roll angle, and decide whether or not to display a camera's show cone. The roll is the sidewise tilt of a camera, and you can animate this just like any other camera movement. You can include more than one camera for your scenes, and switch between them in any frame of an animation. This type of built-in editing can save considerable time, just as having many cameras on any movie or TV set is an extremely valuable resource. You can provide atmosphere effects, such as fog or distance cueing, using the 3D Editor. Fog is the more general atmosphere effect, which has a dialog to allow you to define its color and HLS properties just like lights.

You have the option of saving your 3-D models and animations in readable ASCII format for more rapid editing, for reference, or for aid in translating 3D Studio models into other software tools. This turns out to be a very important feature, because it provides a means for reusing work done for one animation in others. For example, the same movements can be retained, but the names of all the objects can be edited and replaced with other objects.

In short, once you have produced the movement for any animation, this identical movement can be reused with any other objects just by editing the object names in the .VUE file. The limitation is that these .VUE files can only be used with the Renderer in command line mode. The 3D Editor in v2 also allows you to explode objects. The size limit for 3-D models in 3D Studio is 64,000 vertices or points.

OTHER EDITORS

This 2-D graphics editor is useful for two main purposes—for creating shapes to be extruded by the 3D Lofter into 3-D prisms or cylinders of various kinds, and for creating special geometrical paths for animation objects to traverse.

The 2D Shaper creates shapes as 2-D bezier spline polygons. A host of editing conveniences is provided to simplify and speed up this development work. You can combine curved and straight segments, insert vertices

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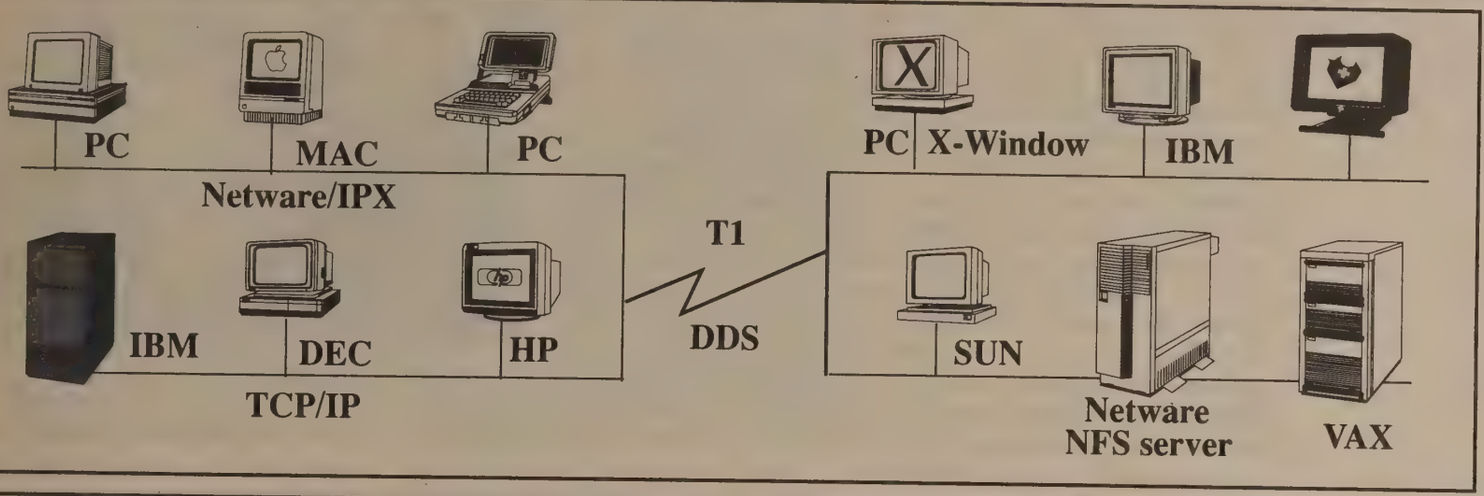

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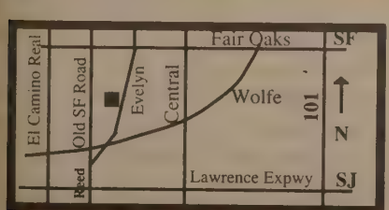

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into existing polygons, mirror a polygon, automatically generate circular arcs and regular polygons, etc. This is also the place where you can create patterns of written text in various fonts to be lofted into 3-D logos.

The 3D Lofter takes the 2-D shapes you have available and lofts or extrudes them into 3-D objects for use with the 3D Editor and Keyframer. Its power is that it not only can loft such objects along a rectilinear axis, or a circular one, as a lathe would, but along any path of curvature you provide. Although the lofting path may be a spline, the resulting 3-D mesh object does not consist of spline curves at all, but solely of interconnected triangular faces.

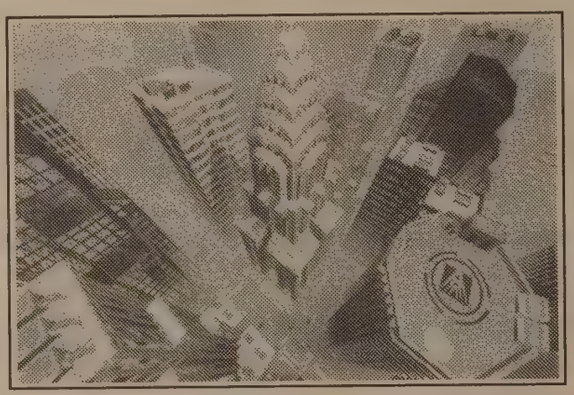
Those paths that are are built-in, and can be quickly generated based on selections made from an option dialog, are the Surface of Revolution and Helix paths. Powerful capabilities exist for modifying paths, for example, rotating them in three-dimensional space about their start vertices.

Five basic deformations can be performed on lofted objects: Scale, Twist, Teeter, Bevel, and Fit. Teetering refers to the ability to alter the rotation of each cross section of a model shape along its generation path. These rotations can be made around any axis, so that the variety of resulting "teetered" objects is quite enormous. Beveling refers to altering the unit size of nested polygons in opposite directions during the lofting process. The Fit technique produces some interesting and powerful results. Instead of a deformation spline, two closed polygons called the fit polygons can be used to generate unusual shapes in a process similar to having the polygons cut away from a solid block. One polygon controls shaping along the X-axis and the other along the Y-axis. In short, this means that you can create extraordinarily shaped objects very rapidly with the 3D Lofter as long as they have a single axis of symmetry.

The Materials Editor is the tool you use to edit entries in your library of surface materials or to create entirely new ones. Not only can a variety of parameters for color, shininess, and transparency be combined in almost endless variety, but you can also use various special effects, such as texture maps from external image files.

I mentioned earlier that texture maps with one of three alternative geometries can be applied to objects in the 3D Editor. Other important choices you have in the visual appearance of your objects are provided by the various shading modes, which include wireframe, flat, Gouraud, and Phong. The Gouraud and Phong shading provide the most realistic shading, but animation methods allow for such transformations as changing the shading mode on the fly—for example, to dramatize the emergence of new products from design groups.

Besides shading modes, the other special effects available include the Two-sided and Self-illum options. The Two-sided option ensures that in the case of open objects with one or more faces removed, both the interior and exterior will be shown with the same surface material. With the Self-illum option you can turn an object into a light source in its own right, with certain specular highlights, even though no shadows are cast on it. The Materials Editor also provides facilities for helping you manage your surface material libraries by combining them into various practical category combinations.



RENDERING

The 3D Studio Renderer does not have a special control screen all to itself, but is integrated with the 3D Editor and the Keyframer. It is also possible to run the Renderer in command line and batch processing mode.

Besides the advantage of being able to allow the computer to carry out the rendering of many images or animations unattended, the command line mode also has the important advantage of allowing you to use .VUE files to specify the movements and transformations. This opens up the important modular capability of reusing the same or similar movement routines with entirely different sets of objects. The limitation on using automated batch mode is primarily your disk storage capacity. All the files needed for rendering, as well as the results of the rendering, have to fit there. When rendering images or animations one at a time, only the files needed for each operation are needed at the time. You are able to swap them off to other media after each rendering.

The 3D Studio Renderer stores color in four different channels: red, green, blue, and alpha. The alpha channel stores 256 levels of transparency which are available to each displayed pixel. A very large range of screen resolutions are supported by the Renderer, including those as high as 24-bit graphics at 4096 x 4096.

When rendering, you have the option of using automatic shadow mapping. Your decision in this will often produce a large difference in rendering time, so that much development work can be done in "draft mode" with the shadow mapping turned off.

Besides the texture mapping already described, the Renderer also supports Bump Mapping, Reflection Mapping, and Opacity Mapping. The Bump Mapping technique lets you map the brightness values of images in such a way that they appear to register variations in the height of an object's surface. Reflection Mapping is a technique you can use to provide a photo-realistic enhancement with reflections mapped onto metallic and other smooth, shiny objects. Opacity Mapping refers to a technique similar to Bump Mapping, which uses the variations in transparency to give the effect of a porous texture.

THE KEYFRAMER

This is the real heart of 3D Studio, the tool you use to actually create the frames of your animations. Its power stems from the fact that only the key frames for transformations need to be constructed. The intervening frames are then generated automatically through "tweening."

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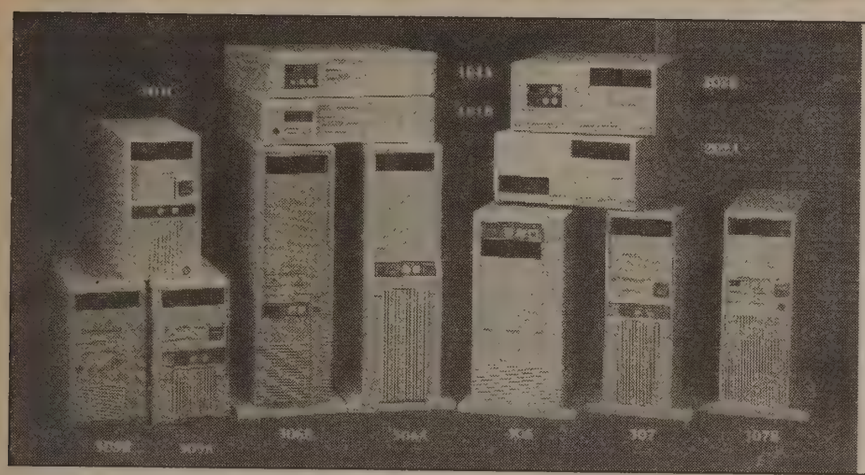

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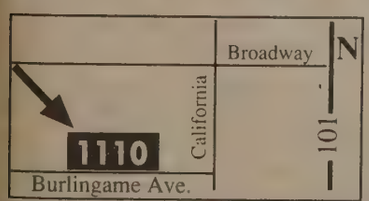

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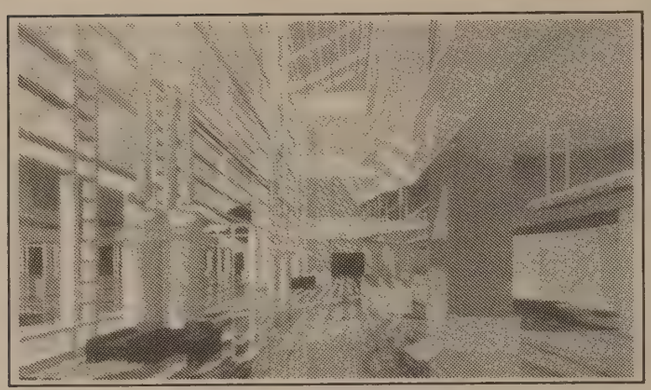
is that it is often relatively easy to speed up and slow down the movement in an animation you're developing. To speed it up, you can just decrease the number of frames between keys. To slow it down, you increase them. In a tool without keyframing, you would have to either throw out frames you'd already made or make new ones. The key frames are portrayed on the screen with track grids that allow various editing and manipulation operations. Every object has a separate track for each type of transformation that it is capable of. For example, there are separate tracks for rotation, position change, and morphing.



The 3D Editor includes all the facilities you need to "make a scene," letting you create not only a cast of 3-D animation characters, but all their props and settings.

If you only need to see a wireframe version of your animation's movements, there are playback control icons to facilitate doing that. As a convenience there is also a playback icon on the Key Info and Track Info dialogs so that you can test changes while the dialog box is still open. There are also icon buttons for moving just a single frame back or forward, as well as for instant rewind. The Keyframer is the heart of 3D Studio and a major source of its power and appeal.

HIERARCHICAL LINKS

A very strong feature of 3D Studio is its capability to link various objects together for different transformations, and also to provide various series of links over which the transformations can be transmitted.

For example, you can rather easily get the effect of the transmission of movement and rotation over the links of a chain of the vertebrae in a spine. You can also accomplish this by a provision for inheriting links that involves an editing technique called Dup Links; this allows you to assign the links and create the new nodes at the same time. The enormous difference between making frame movements by moving whole assemblies of objects at once, rather than each one individually, cannot be overemphasized. Besides objects, you can also provide links with cameras and lights, which means that operations like tracking moving objects with spotlights and cameras are done virtually automatically.

INSTANCES AND DUMMIES

The Keyframer also has efficient ways of making clones of objects, including instances and dummies.

Instances are geometrical duplicates whose motion can be different from their master object but whose geometry cannot. They are only visible in the Keyframer because they really only consist of key data.

Dummies are objects that are invisible at render time, but are useful for coordinating the motion of other objects linked to them. For example, if you want objects to rotate about a common center, but there is no animation object at this central point, you can put a dummy there that forces the objects linked to it to move with it.

USING 3D STUDIO WITH OTHER AUTODESK PRODUCTS

Importing and exporting 3-D geometry between 3D Studio and AutoCAD is accomplished with the latter's .DXF file. There are some limitations involved in doing this, and some additional editing is usually needed to make the models fully usable for animation. But in Studio 3D v2, this capability has been improved considerably. On the whole, this capability works especially well for creating things like architectural walkthroughs from architectural designs prepared with AutoCAD.

3D STUDIO AND ANIMATOR PRO

Animator Pro is the tool to use for joining and compositing animations made with 3D Studio. The animated cell capability of Animator Pro is also very useful for embedding 2-D animated routines within 3-D animations, a useful option when it's too resource-intensive to handle them in 3-D. It is especially suitable, for example, for handling animated texture mapping. An example of this might be the depiction of something on a motion picture screen or TV within the animation scene.

CONCLUSION

As you may have already realized, it would be hard to find a desktop animation tool to top 3D Studio. The only place you might fault it is in the user interface design. But even if it may not be your idea of the best possible user access design, you get used to it rather easily.

I tested 3D Studio on a 33MHz 486 machine with a 256K cache and the performance seemed just about right. On a machine of any lower power, the results may be less than what you'd consider satisfactory.

The only real question is where Autodesk will take this program next. In any case, those lucky enough to own a copy of this latest release are no doubt busy putting all the great new features to work creating the next generation of artful animations. ■

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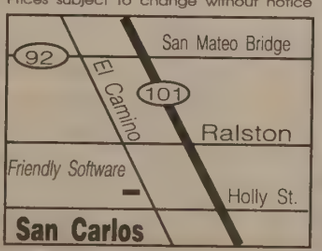

Weird Tales

From The Mac Universe

Compression, Recycling, Strange Movies, And More

BY DAVID MORGENSTERN

BMUG

Raines Cohen, one of the founders of BMUG, is spending the summer on a honeymoon bike tour across the US. He's visiting user groups along the way, and phoning in his progress to the weekly BMUG meeting. Marketing representatives are interrupted mid-demo to let everyone hear the latest road weather report from Cohen.

We are hoping to see him in the flesh, bearing bicycle and PowerBook, when he ends the trip at the August Macworld Expo in Boston. He plans to ride straight to the BMUG booth on the show floor. After the grueling Cascade Mountains, he should have no trouble with the ride down the escalator!

THE GOOD, THE BAD, AND THE INEXPLICABLE

There is no doubt that as technology moves forward in high gear, our society and culture are left eating silicon dust. But even when my world seems ready to join my hard drive in crashing, some BMUGer will pick me up—or pick up a car.

We haul a truckload of paraphernalia up to our weekly meeting. After a recent meeting, we discovered that some joker had parked his car so that it completely blocked the parking lot exit. A crowd of BMUGers, parking officials, and passers-by stood around wringing their hands. Cliff Stoll, BMUG regular and author of *The Cuckoo's Egg* (and an upcoming book that he says combines astronomy and sex) cut to the essentials by persuading everyone on the scene to lift the car out of the way! Someone may have thought they were joining a nerd frat-house prank. BMUG—Isn't that Beta Mu Gamma fraternity?

Here are some items that caught my eye —I can't seem to fit all of them into my world view. Hopefully, you will have better luck!

• On my weekly drive across the bridge to the BMUG main meeting, I ponder the message on a prominent billboard: "Last year, more people bought Everex computers than voted for Frank Jordan." Jordan is the honorable mayor of San Francisco.

I have no idea what this ad is trying to say. Is it a commentary on the electoral system—so few people voted for the mayor that a welterweight manufacturer looks golden in comparison? Given the turnout in most American elections, I would guess that the clone shop down the street should do better than the entire vote count. Or is it an announcement for the next election? "Our computer ran better than the mayor, so we're going to enter a PC as a candidate four years from now." Scary thoughts!

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• The search for perpetual motion has bankrupted many sincere but foolish investors over the centuries. The 21st Century equivalent has arrived on the scene—unlimited lossless data compression.

There are two types of compression: lossless and lossey. Lossless means that your data is not changed in the process of shrinking and expanding. You can repeat the process over and over, but the file should read identically each time. The best lossless compressors can cut a file's size in half.

Lossey methods throw out some of your data permanently when it's compressed. You might ask why anyone would want to lose even a single bit of hard-earned data? Since the compressor doesn't have to worry about every detail, it can really knock the kilobytes off a file's size. It depends on the data. If you have a database or text, it's critical to have each and every word and number correct, but perhaps not as critical in a movie zooming along at many frames a second.

Developers are busy finding the right compression algorithms for specific data types. The Joint Photographic Experts Group (JPEG) has spent years fine-tuning the way that high-resolution images will be shrunk. Apple is currently negotiating with SuperMac to get at a better compression technology for QuickTime digitized video. This would replace the current Apple Video (code-named Road Pizza) compression method.

All compression technology works on the principle that repeated or predictable combinations of characters can be replaced by a single character or formula. It's the science of computer shorthand, called information theory. Supposedly there's a theoretical minimum amount of space that will be needed to accurately represent a particular file.

The techno-hucksters are waving the holy grail of unlimited lossless data compression in front of the venture capitalists. They claim that you can have any data type shrunk down fifteen or more times without any loss of data. These highly secret methods somehow work outside the laws of information theory. They also claim to be able to recompress already compressed files for additional savings.

You don't have to be a genius to know something is fishy when the compression program only works when the salesman is demonstrating it. A Macintosh "version" is being shown around the Valley now, so investors beware. Anyone putting their dough into any of these voodoo compression schemes should run immediately to their head shrinker.

• On the dribbling edge of technology is Digital Deviations in San Jose, owned and operated by the irrepressible Chuck Farnams. Farnam's beyond-questionable taste is evident in his latest effort: The SeedyROM by CyberCowboy Films.

The CD is filled with sick QuickTime movies that he calls "performance pieces." The boundaries of eternal art are stretched to the breaking point with vignettes of Santa Claus throwing up, oozing surgical wounds with a jazz musical background, and the CleavageCAM. Chuck approaches his work as a democratic public service, with something to offend everyone. He's hard at work on the next volume in this SickTime series.

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When they're not busy squashing Video Display Terminal (VDT) legislation, computer manufacturers have gotten into the environmental act. A number of major manufacturers have joined in an effort to reduce the power required to keep our computer pals up and running. Apple has been doing some other noteworthy environmental actions.

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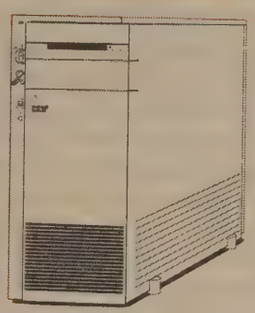

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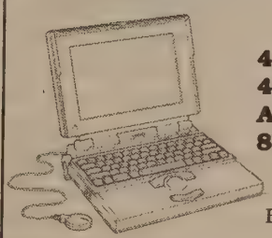

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Fujisu 520MB HD	$1495†	Maxtor 760 Meg HD	$1595††

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Storage Disks

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Mass Micro 128MB Optical	$69	Sony 800K, 1 Pak, Qty 20+	75¢

MAC = Macintosh Rental

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cartons consumes less energy, and doesn't produce as much hazardous waste as the bleached versions. Most of the new packaging uses already recycled materials.

Apple gets more than a warm fuzzy feeling with the new packaging. The brown cardboard boxes cost less than the white, while being just as sturdy. The brown color doesn't show the wear and tear of shipping so easily, so dealers (and their customers) don't complain about scuff marks as often. Everyone likes the new boxes better than the old ones. The environmental movement has been telling industries for years that these changes make good business sense!

PowerBook owners are always concerned with their batteries, but they may not be aware of the health problems relating to them. Rechargeable batteries are only good for a couple of years' use. These batteries contain heavy metals—lead or cadmium—which should not be tossed into landfills or incinerators. Apple has a program that allows users to return used computer batteries for recycling and disposal. Just take them into your local "Authorized Apple Service Provider," which is industry-speak for a dealer.

There is also a program to help customers recycle spent toner cartridges from their laser printers. All US Apple toner cartridges now include a prepaid shipping label in the cartridge box. The user repacks the old cartridge into the new box, attaches the label, and drops it in the mail. They will do this for any Canon-engine laser cartridge. You can contact their Customer Assistance Center (1-800-776-2333) to obtain a prepaid shipping label. For every cartridge returned in the US, a dollar will be donated to an environmental organization, either the National Wildlife Federation or the Nature Conservancy.

BYTES AND PIECES

Here are a couple of random tips and a plug for an interesting book:

• Scott Kronick, longtime BMUGer, has always been known for his entertaining writing and tremendous wit. You may have read some of his hilarious computer-related Top-10 lists in this column or in the *BMUG Newsletter*. He's also written a couple of programming books, including *Macintosh Pascal Illustrated: The Fear and Loathing Guide*. I'm not a programmer, but I loved this book. In between the coding examples were slices of life and wisdom from Mr. Moss, Kronick's alter ego. His writing turned a dry computer textbook into a creative adventure, exercising both right and left brains.

Kevin Moss is also a prominent character in Scott's latest opus, *The Macintosh Woman*, a novel. It's really four stories written over a span of a dozen years that follow the the inner lives of a few friends, with a side fugue into a science fiction movie. The book is not a linear narrative, but rather jumps around like hypertext, speaking in different voices and thoughts. I recommend that readers start with the accessible even-numbered chapters before venturing into the chaos and discoveries of the odd-numbered. I think you will enjoy it.

Kronick has self-published the book and will autograph it if you come by a BMUG meeting. *The Macintosh Woman* is $14 (postage included) from Kronick, 1442A Walnut Street, Suite 278, Berkeley, CA 94709

• One of the great things about System 7 is that we don't have to worry about installing fonts, sounds, and desk accessories in the system. The new System file is really a special kind of folder and you can drag the icons of files into it. Older Macintosh systems need the assistance of a installation utility called Font/DA Mover to do the job. The Mover was considered by everyone to be the highest form of Macintosh software design—*Not!*

Suppose you've loaded a bunch of neat TrueType fonts into your System file and carelessly tossed away the suitcase files they arrived in. I know you would never do such a thing, right? System 7 extracts fonts and desk accessories out of the "old-fashioned" suitcases, and converts them to a new format. But what happens if you want to give someone still running System 6 these fonts, since the new format can't be used by older systems?

You don't have to panic, or even search for your old Font/DA Mover 4.1 program. Copy one of the suitcases from the Fonts disk of System 7. Open the suitcase and toss the fonts inside into the Trash. Go to your System file and copy the fonts you want into the empty suitcase. You may have to hold down the Option key, if it's the currently active system. Rename the suitcase, and you're done!

• I was recently trying to show a friend the wonderfulness of telecommunications. We were using his home computer and downloading something from the BMUG Bulletin Board. Everything was fine until his call-waiting decided to interrupt our session and destroy the download. Dueling technologies fighting for time on the copper wire!

The *70 command is the typical tone-disable call-waiting command. Unfortunately, most users have problems just placing it in front of their dial script. The call-waiting equipment wants you to send the disable command, and then after a moment send the phone number that the command is to be applied to. Your modem can do this by using a comma in the dial string (example, *70,555-5555), which creates a couple of seconds' pause. If this doesn't work, try two commas, two aspirin, and a glass of water.

The call-waiting is automatically turned back on when you hang up the phone. I detest this feature provided by our Baby Bells, and not just for its screwing up my modem demonstration. The busy signal was good enough for our ancestors...

SHAREWARE SPOTLIGHT

The game that is sweeping the BMUG office right now is the shareware Forty Thieves 2.1. It's a solitaire simulation by Eric Snider, and is beautiful in color. The game keeps a running tab of your scores and won/loss percentage. It's a rough one to win, and some calculating players are improving their scores by bailing out of games they know they can't win through the debugger. Shame, shame!

It's available on BMUG Games E1 disk.

UPCOMING EVENTS:

August 6	Shareware Sharing Night. See the shareware that BMUG loves the most, and bring your favorite to show-and-tell!
August 13	Digidesign—Audiomedia II (CD-quality recording); Lucasfilm Games—The Secret of Monkey Island.
August 17	BMUG South at United Way Building in San Jose. Abacus Concepts—Statview 4.0 (statistical analysis).
August 20	Axion—Axion Switch; My Software—My Database, My MailList, My LabelDesigner.
August 27	Advanced Software—InTouch and DocuComp II; Equilibrium—DeBabelizer (graphics image-processor).
August 31	BMUG West at Exploratorium museum in San Francisco. Advanced Software InTouch and DocuComp II; ExperVision—Expervision (OCR).

Call the the BMUG Announcement Line for the latest information on great BMUG Special Interest Groups (SIGs)! (510)849-9114.

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WHAT IS BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its thirteen thousand international members. BMUG supports many Special Interest Groups (SIGs), a Bulletin Board System (BBS), a free HelpLine, a software library, weekly meetings, publications, and much more. BMUG also puts out a semiannual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC Berkeley campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, 2055 Center Street (a half block from the BART station) is open to the public 9 am–5 pm. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (510)540-1742, and our fax number, (510) 849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am–5 pm). If your question can't be answered on the spot, we try to get you in touch with someone who can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around, with hundreds of disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *TV-ROM*™, a fantastic collection of public domain QuickTime videos.

Our sixteen-line BBS offers many of the latest versions of files in our software library, as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you can get in touch with us wherever you are and send mail to users everywhere! With our multiline capability, you can have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most electronic services. BMUG can also be reached through the international USENET network through bmug@garnet.berkeley.edu.

For further information about BMUG, please write to: BMUG, 1442A Walnut St., #62, Berkeley, CA 94709. If you prefer to phone our business office, call (510)549-BMUG, or fax (510)849-9026.■

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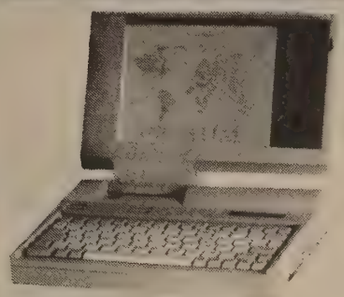

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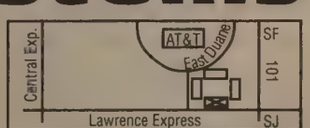

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RESOURCES

Calendar Of Events

AUGUST

August 1 Build & Upgrade An IBM PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 3 Beginning dBASE IV Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 3–5 GroupWare '92 Conference And Exposition. San Jose. The Conference Group. Call: 1-800-247-0262.

August 4 Intro To FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 4–5 Novell System Supervisor 3.11 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 5 Intro To WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 6 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 6–7 Intelligent Control Based On Fuzzy Logic And Neural Networks Course. Menlo Park. UC Berkeley Extension. Call: (415)323-8141.

August 7 Intro To PageMaker 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 8 Computer Show & Sale. Baybridge Holiday Inn, Emeryville. MarketPro. Call: (415)388-8893.

August 8 Computer Show & Sale. San Francisco Cow Palace. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

August 8 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 9 Computer Show & Sale. Marin Civic Center. MarketPro. Call: (415)388-8893.

August 10 Adobe Illustrator For Windows, Level One Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 10 Intermediate Paradox 3.5 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 10–11 The Macintosh Survival Course. San Jose. Data-Tech Institute. Call: (201)478-5400.

August 10–11 Project Planning Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

August 10–11 TCP/IP Network Programming Workshop. San Francisco. UC Berkeley Extension. Call: (510)642-4111.

August 10–12 The National Software Re-engineering & Maintenance Conference. San Jose. DCI. Call: (508)470-3880.

August 10–12 Silicon Valley Personal Computer Design Conference. Santa Clara. SkyTech. Call: (408)924-3930.

August 10–13 Fifth C++ Technical Conference. Portland, OR. USENIX. Call: (714)588-8649.

August 11 WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 11–12 MS-DOS For CAD Class. San Francisco. SFSU Extended Education. Call: (415)338-1207.

August 11–13 Second Annual InterNet 2000 Conference. Sacramento. SNUG and Novell. Call: 1-800-231-2000, ext. 227.

August 12 Adobe PhotoShop Course. San Jose. Abacus Training. Call: (415)974-7200.

August 12 Aldus FreeHand Class. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

August 12 Intro To Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 12 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 13 DacEasy Accounting Seminar. San Francisco. The Phoenix Institute. Call: (415)362-0214.

August 13 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 13–14 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 14 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 15 Computer Mart. Cupertino. De Anza College Special Events. Call: (408)864-8350.

August 15 Computer Show & Sale. Oakland Coliseum. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

August 15 & 22 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 16 Computer Show & Sale. Hayward. MarketPro. Call: (415)388-8893.

August 17 Using WordPerfect For The Mac

Continued

AUGUST 3–5

GROUPWARE '92

San Jose Convention Center

GroupWare '92 is the first conference and exposition to focus on the commercial applications of groupware, a new category of software that lets people within an organization work together more productively. Groupware applications provide an environment in which communication, scheduling, editing, information access, project management, and other types of collaboration are facilitated via computers. Presentations will include addresses by Jim Manzi of Lotus Development, Philippe Kahn of Borland International, Ray Noorda of Novell, and industry analyst Esther Dyson. Contact: GroupWare '92, 1-800-247-0262.

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CFP '93 will assemble experts, advocates, and interested people from a broad spectrum of disciplines and backgrounds in a balanced public forum to address the impact of computer and telecommunications technology on freedom and privacy in society. The organizers have issued an invitation to submit session and topic proposals for inclusion. Proposals may be for individual talks, panel discussions, debates, or other presentations in appropriate formats. For information on proposal submissions, write to: CFP '93 Proposals, 2210 Sixth St., Berkeley, CA 94710 or email: cfp93@well.sf.ca.us with the word "Proposal" in the subject line.

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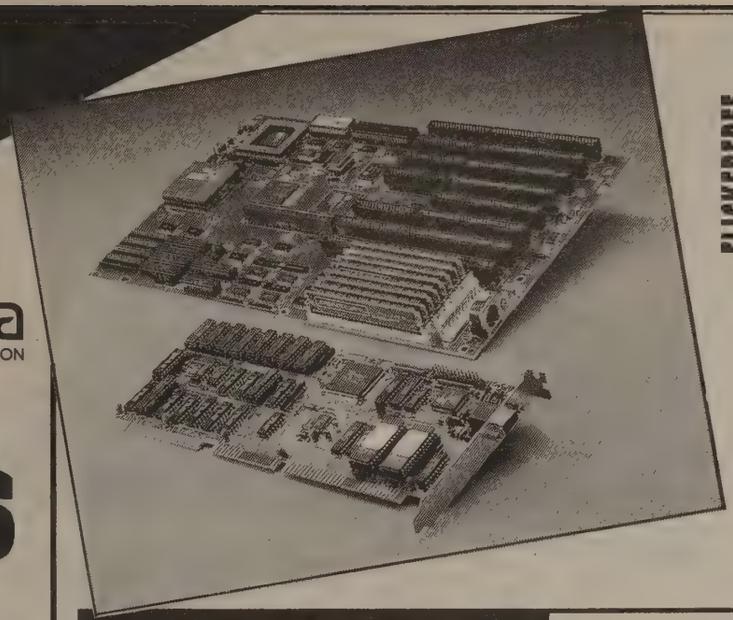

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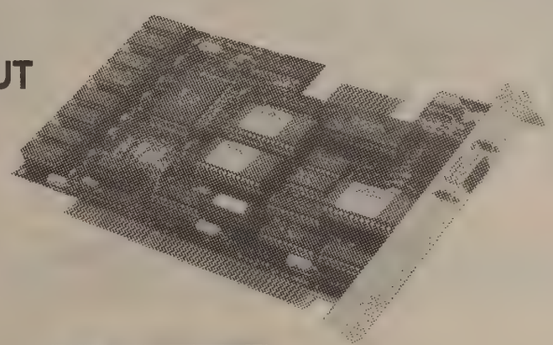

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San Fran cis co (san′ frən sis′ kō-) *n.* **1.** seaport on the coast of north central California, separated from Oakland by an inlet, and from the rest of the U.S. by a state of mind; **2.** setting for fabulous restaurants, entertaining diversions and memorable encounters; **3.** where Seybold (see above) will be this September.

Plan to get together with industry leaders, fellow computer publishers and other communications professionals as Seybold and San Francisco get together again this September.

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Calendar Of Events continued

Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 17–18 Intro And Intermediate Excel 4.0 Class. Lafayette. On-Site/Off-Site PC Training. Call: (510)283-6221.

August 17–19 C++ And Object-Oriented Programming Seminar. Santa Clara. UC Extension, Santa Cruz. Call: (408)748-7375.

August 17–21 SCO Forum92: The International Technical And Marketing Conference. Santa Cruz. NDN Enterprises. Call: 1-800-553-9939.

August 18 Advanced WordPerfect For The Mac Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 18–21 Intro To AutoCAD Class. San Francisco. SFSU Extended Education. Call: (415)338-1207.

August 19 Intermediate Word For Windows Class. San Ramon. MicroTek. Call: (510)831-8075.

August 19–21 Time Line 5.0: Project Management Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

August 20 Accounting Systems Seminar: Tax And Managerial Reporting. Oakland. David Simon, CPA. Call: (510)893-5753.

August 20 Adobe Illustrator Course. San Jose. Abacus Training. Call: (415)974-7200.

August 20 Advanced Quark Class. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

August 20 Advanced WordPerfect 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

August 20–21 Intro And Intermediate Excel 4.0 Class. Lafayette. On-Site/Off-Site PC Training. Call: (510)283-6221.

August 20–21 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 20–21 Q&A: Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

August 21 Intermediate Excel For Windows Class. San Ramon. MicroTek. Call: (510)831-8075.

August 21 Windows 3,1, Level One Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 21 WordPerfect Desktop Publishing Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 21 WordPerfect For The Legal Profession Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 22 Intro To AmiPro Class. San Ramon. MicroTek. Call: (510)831-8075.

August 22 Computer Show & Sale. Sonoma County Fairgrounds. MarketPro. Call: (415)388-8893.

August 24 Wireless LAN Seminar. Oakland. Informational Data Network. Call: (510)465-9084.

August 25 Intro Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 25 Microsoft Excel Macros Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 25–27 Downsizing Expo. San Francisco. DCI. Call: (508)470-3880.

August 26 Intro To The Macintosh, System 7 Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 26–28 Cohesion In A Distributed, Open Systems Environment Conference: Developing And Managing Software Assets Using CASE. Boston. BIS Strategic Decisions. Call: (617)982-9500.

August 26–December 23 Design For General Printing And Desktop Publishing Course. Oakland. Laney College. Call: (510)464-3263.

August 26–December 23 Electronic Publishing For The Publishing Professional Course. Oakland. Laney College. Call: (510)464-3263.

August 27 Advanced Adobe Illustrator Course. San Jose. Abacus Training. Call: (415)974-7200.

August 27 Intermediate WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 28 Intermediate Excel For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 28 Windows 3.1, Level Two Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 29 Computer Show & Sale. San Francisco Cow Palace. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

August 29 Computer Show & Sale. Solano County Fairgrounds. MarketPro. Call: (415)388-8893.

August 30 Computer Show & Sale. Scottish Rite Center, Sacramento. MarketPro. Call: (415)388-8893.

August 31 Adobe Illustrator For Windows, Level Two Course. San Francisco. Abacus Training. Call: (415)974-7200.

August 31–September 3 Object-Oriented Programming In C++ Course. Berkeley. UC Berkeley Extension. Call: (510)642-4151.

SEPTEMBER

September 1 Windows 3.1, Level One Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 2 Intro To The Macintosh, System 7 Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 3 Beginning dBASE IV Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

September 3 Beginning PowerPoint Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 3 Intro To MacDraw Pro Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 3 Intro To The PC/Beginning DOS 5.0 Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 5 Computer Show & Sale. Alameda County Fairgrounds. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

September 6 Computer Show & Sale. Sheraton Hotel, Concord. MarketPro. Call: (415)388-8893.

September 8 Intro To FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

September 8 WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

September 9 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

September 9 Microsoft Excel Course. San Jose. Abacus Training. Call: (415)974-7200.

September 9 WordPerfect 5.1, Level One Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 9 WordPerfect For DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

September 10 Adobe PhotoShop Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 10 CorelDRAW Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 10–11 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

September 11 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

September 11 Microsoft Excel Course. San Francisco. Abacus Training. Call: (415)974-

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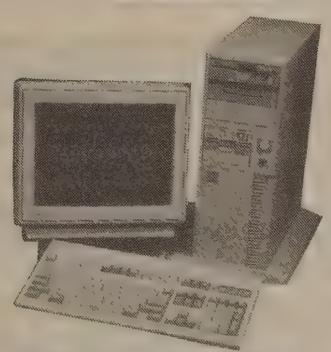

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MaxiSwitch	35
Omnikey 102/Ultra	72/105

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Calendar Of Events continued

7200.

September 12 Computer Show & Sale. Hayward. MarketPro. Call: (415)388-8893.

September 12 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

AUGUST 8 & 11

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September 13 Computer Show & Sale. Sonoma County Fairgrounds. MarketPro. Call: (415)388-8893.

September 13 WordPerfect 5.1, Level Two Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 14 Windows 3.1, Level Two Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 14–15 Novell System Supervisor 3.11 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

September 15 Aldus FreeHand Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 15 Intermediate Paradox 3.5 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

September 15 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

September 15–16 PICK/UNIX/DOS Alternative Conference. San Jose. International Spectrum. Call: (619)578-3152.

September 16 Microsoft Excel Charts Course. San Jose. Abacus Training. Call: (415)974-7200.

September 17 Accounting Systems Seminar: Tax And Managerial Reporting. Oakland. David Simon, CPA. Call: (510)893-5753.

September 17 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

September 18 Advanced WordPerfect 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

September 19 Computer Mart. Cupertino. De Anza College Special Events. Call: (408)864-8350.

September 19 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

September 20 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

September 21 MacWrite Pro Course. San Jose. Abacus Training. Call: (415)974-7200.

September 21 Smart Color '92 Seminar. Palo Alto. Savitar. Call: Sarah Mlyneux, (415)243-

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* Aug. 9 - SAN RAFAEL
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Aug. 22 - SANTA ROSA
Sonoma Co. Fairgrounds

Aug. 29 - VALLEJO
Solano Co. Fairgrounds

* Aug. 30 - SACRAMENTO
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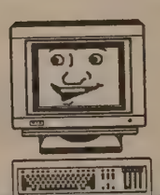

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✦ This Buyers' Guide Will Increase Your Sales

MicroTimes will showcase your store, your products, and your service. Here's your perfect opportunity to spotlight your store—tell your potential customers about the unique service your business offers, your in-house experts and the guidance they provide in such areas as LANs, Desktop Publishing, Systems Integrations, Accounting, and other specialties.

In addition to listing your store's name and other information alphabetically by geographical area, this year we're offering an additional feature to enable your prospective customers to find you quickly: **a separate directory of vendor-authorized sales, service, training and support providers.** So if you're authorized to provide these services for Novell, IBM, Apple, Sun, Hewlett-Packard, or other name-brand products, please give us that information so we include your name in the vendor-authorized listings.

✦ A Great Place For Your Advertising Message

The year-end issue of **MicroTimes** will bring customers into your store during your most important selling season and throughout the following year. They'll see your message next to an exciting lineup of editorial features, including our writers' picks for the best hardware and software products of 1992 and over 30 pages of Buyers' Guide announcing new products and special offers—many of which you'll already have in stock, ready to sell!

You'll also benefit from our own special promotions of this exciting issue which will appear in October and November. **MicroTimes** will help you build the consumer excitement you need to ring up sales as you ring in the New Year.

✦ Take Advantage Of This FREE Editorial Listing!

Complete the attached form and return it to **MicroTimes** before October 1, 1992. **If your store has more than one location, please use a separate form for each.**

And plan now to make the most of your selling season with the **MicroTimes 1992 Computer and Software Buyers' Guide!**

✦ For advertising information, call (510)934-3700 or (213)851-8600.

MicroTimes 1992
Computer and Software Buyers' Guide Reseller Poll

Mail to: Reseller Poll, 3470 Buskirk Ave., Pleasant Hill, CA 94523
Fax: (510)934-7351
Deadline: October 1, 1992

Store Name:_____

Store Manager:_____

Address:_____

City:_____ **State:**____ **ZIP:**_____

Phone:_____ **Fax:**_____

What applications does your business specialize in, and who are your in-house experts for each specialty? (List up to three):

Specialty **Expert**

_____

_____

_____

What operating systems does your business support?

MS-DOS__ AmigaDOS__ Windows__ Windows NT__ UNIX (specify variety)_____
OS/2__ Macintosh__ Other (specify)_____

List the three top-selling brands sold at your store in 1991:

_____

What special value-added services (e.g. service, training, support, warranties, return policy, etc.) does your business offer? (Please keep responses under 25 words or we will edit them to fit available space.)

_____

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Are you a vendor-authorized sales, service, training and/or support source?

If so, please list up to five vendors (e.g. Sun, Novell, Hewlett-Packard, Autodesk) who have authorized your business to provide these services, and check the areas for which you're authorized.

Vendor **Sales** **Service** **Training** **Support**

_____

_____

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I certify that all the statements made in this survey are true.

Name:_____ **Title:**_____

Signature:_____ **Date:**_____

Calendar Of Events continued

3030.

September 21–23 Time Line 5.0: Project Management Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

September 21–24 The Fourth Annual Embedded Systems Conference. Santa Clara. *Embedded Systems Programming* Magazine. Call: (214)245-8700.

September 21–25 C++ In Action Conference & Exposition. Santa Clara. Boston University Corp. Education Center. Call: (508)649-4200.

September 22 Beginning Quark XPress Course. San Jose. Abacus Training. Call: (415)974-7200.

September 23 Advanced Adobe Illustrator Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 23 Advanced Microsoft Word For The Mac Course. San Jose. Abacus Training. Call: (415)974-7200.

September 23 WordPerfect 5.1, Level Three Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 23–25 Seybold San Francisco Conference. San Francisco. Seybold Seminars. Call: 1-800-777-6650.

September 24 Beginning PowerPoint Course. San Jose. Abacus Training. Call: (415)974-7200.

September 24 Intro To MacDraw Pro Course. San Jose. Abacus Training. Call: (415)974-7200.

September 24 Microsoft Excel Charts Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 24 Wireless LAN Seminar. Oakland. Informational Data Network. Call: (510)465-9084.

September 24–25 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

September 24–25 Q&A: Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

September 26 & October 3 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

September 28 Advanced Microsoft Word For The Mac Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 28–30 NetWare 386 Administration Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 30 Microsoft Excel Macros Course. San Francisco. Abacus Training. Call: (415)974-7200.

OCTOBER

October 5–6 Intro To UNIX Workshop. San Francisco. UC Berkeley, Extension. Call: (510)323-8141.

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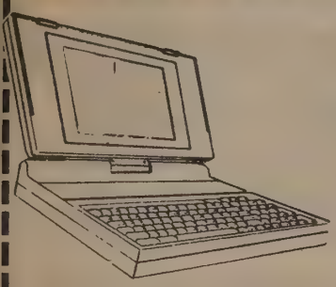

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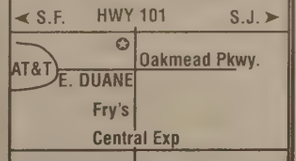

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By Kathleen Creighton

Connect Ed: BBSing Back To School

While some folks are buying new notebooks, pencils, and bus passes for the school year coming up, a very few are warming up their personal computer communications software for an online educational experience in the privacy of their homes.

Paul Levinson, Ph.D., founder of one of the tiny number of online schools, Connect Ed (which grants academic credit through New School for Social Research in New York City), suggests that for various reasons online education, which seems a natural for the telecomm medium, has been very slow to reach its potential. Although he founded Connect Ed in 1985, Levinson says that in 1992 traditional academic institutions are still intimidated by the technology, thinking that online education is something that an institution might offer for "techies."

But for a computer conferencing system, Connect Ed is fairly easy to use, and tuition covers the cost of telecommunications (from the local node to New York City), so finding one's way around the software (Parti) doesn't come with the pressure of having to learn while the clock is ticking off access charges.

Connect Ed "terms" are two months in length, with an average of four or five class offerings every term, and an average of ten students per class. Students get their lessons online, and contribute to and read class discussions there as well. Rather than being dehumanizing (another myth), online discussions and work-sharing among people who are committed to the full term, as opposed to recreational conferencing where people come and go from a conversation, have the effect of creating an intense learning and bonding environment. Many former students have stayed around to keep in touch through Connect Ed's electronic "student union," the Cafe, and through email. The library of relevant texts and papers is always open, along with a bookstore where students can order hard-copy books.

Most Connect Ed students are professionals in business, public sector, and education. A complete master's degree program in Media Arts is available online.

One of the advantages of online education, of course, is that it's possible to study "at" the school without having to move to where it's physically located. This allows the school a broader pool of instructors as well, and several of the instructors are Californians. As with telecommuting for a job, there's quite a lot of built-in flexibility in time of day spent at the keyboard, increased productivity because of the absence of a commute, and a more relaxed dress code.

The down side of online education is that it's available only through a couple of academic institutions, and what's available is as expensive as the private school with which it is affiliated. Connect Ed, for example, charges $393 per undergraduate credit or $416 per graduate credit, along with small registration fees for New School of Social Research. Half-tuition audit rates are available for some courses.

While the tuition is the same as New School's, Connect Ed's international packet switching telecommunications capability is included in the price. Unfortunately, while the prospective student isn't wasting what could be productive time with a commute, or polluting the air by driving to school, the development and acceptance of more online educational facilities is still bound to the high cost of that efficient, nonpolluting phone call to get there. ■

Connected Education (Connect Ed) and the New School On-Line Program
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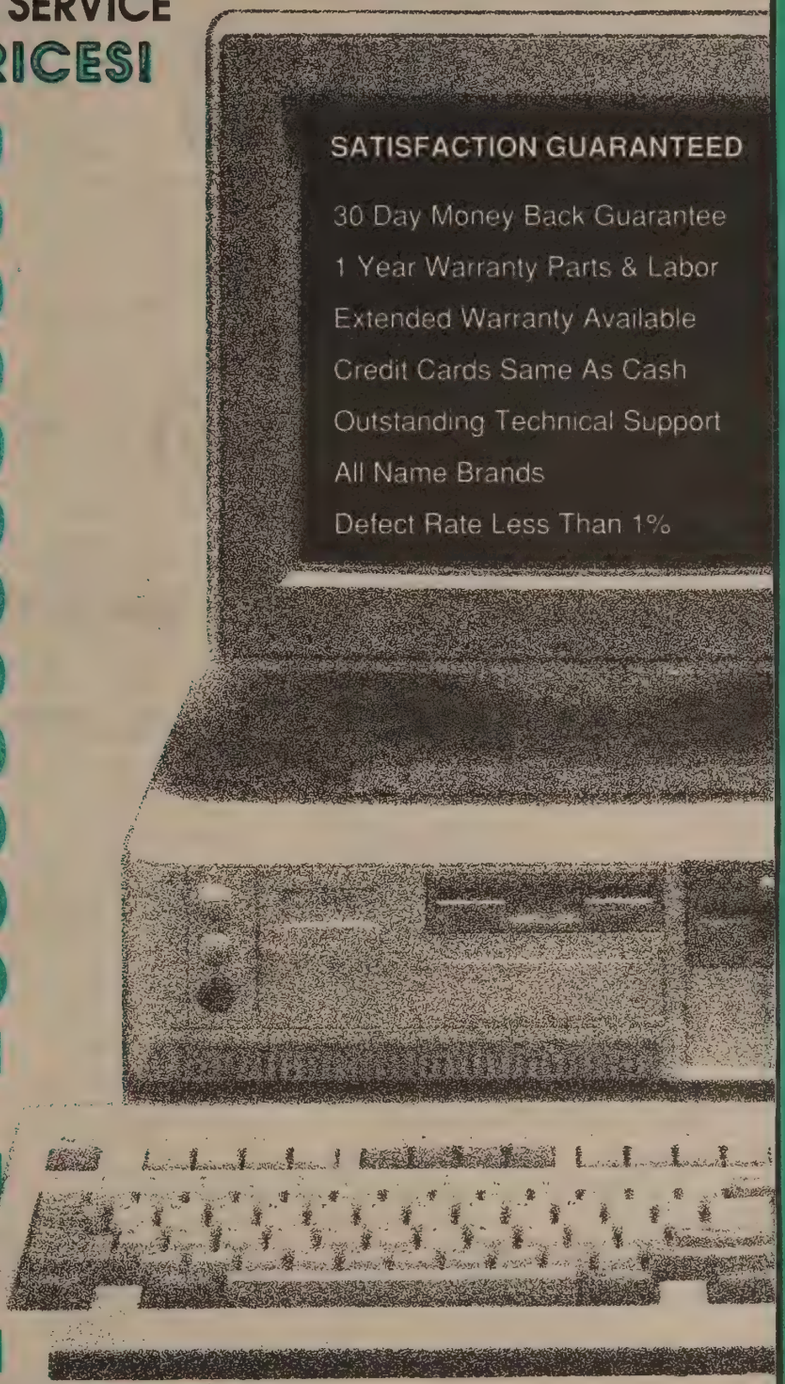

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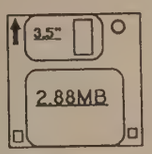

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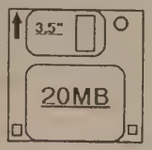

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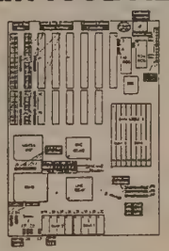

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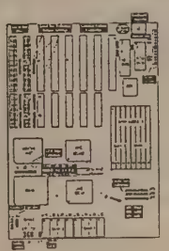

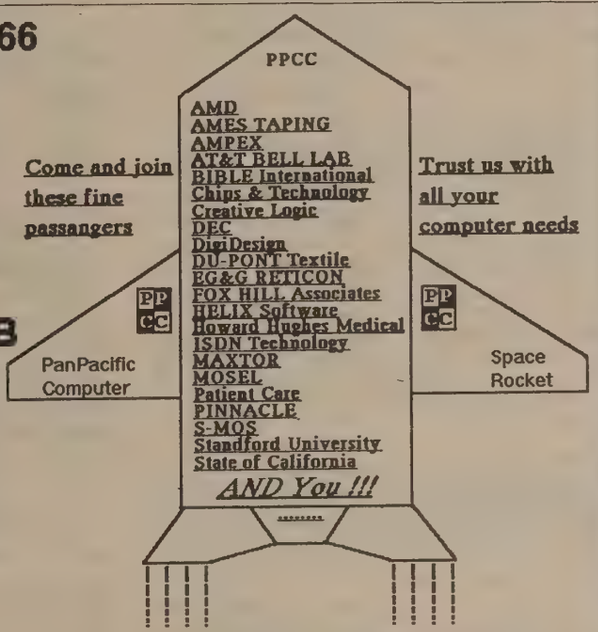

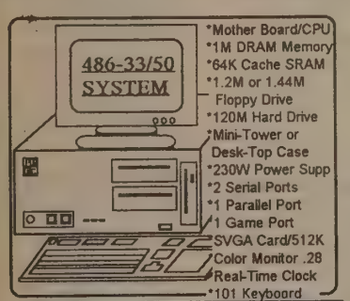

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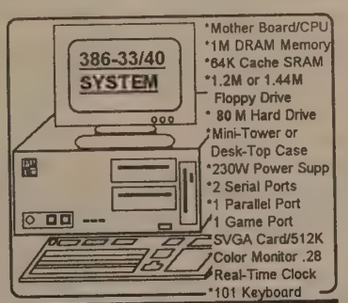

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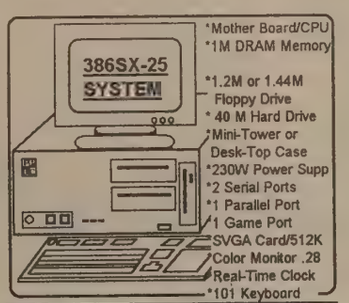

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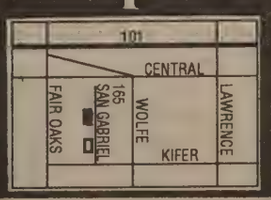

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Grateful Med BBS. (510)689-0347. 8-N-1, 24 hrs., 1200/2400. Health professionals Fidonet/ADANet. Sysop: TC Dufresne. [Exp. #99]

Hall Of Wisdom BBS. (510)540-6768. 24 hrs., 1200/2400/9600. Sciences, arts, history, metaphysics. Computing: DOS, Windows, OS/2, and utilities. [Exp. #99.]

HoloNet Internet BBS. (510)704-1058. 8-N-1, 24 hrs., 1200–14,400. Internet, Telnet, FTP, IRC, MUDs, 2300+ Usenet groups plus USA Today, Newsbytes, DataNet, and Boardwatch. [Exp. #98.]

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Tiger Team. (510)658-0607. 24 hrs., 1200/2400. Files, messages, classic car, firearms, eastern religion. Instant access. [Exp. #99.]

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UNIX Online. (707)792-0402, 795-1721. 24 hrs., Usenet access. For UNIX, Amiga, Mac, and DOS users. [Exp. #98.]

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916

The Crow's Nest BBS. (916)925-7496. 8-N-1, 24 hrs., 300/1200. Commodore 64/128, Vic-20, Plus/4, C16, CP/M, and some PET support. Free. Sysop: John O'Neil. [Exp. #98.]

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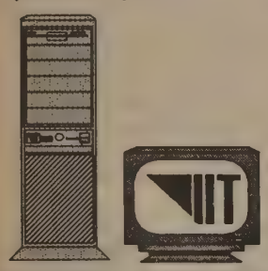

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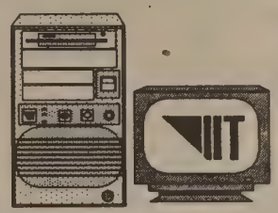

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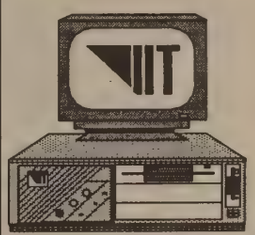

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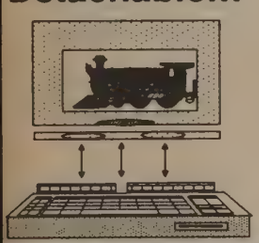

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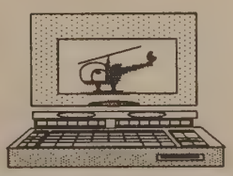

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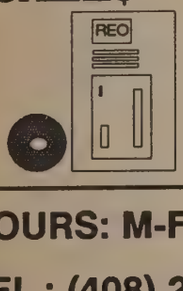

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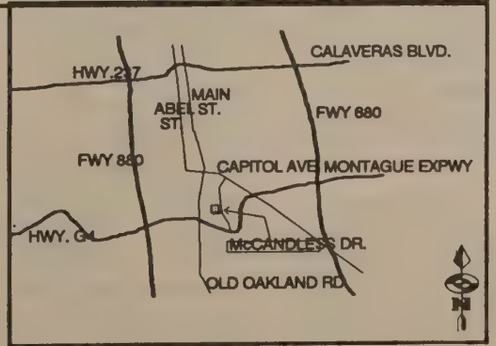

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ASSOCIATIONS

American Association For Artificial Intelligence (AAAI). Call: (415)328-3123. Email: membership@aaai.org. [Exp. #100.]

Association For Women In Computing. Meetings: 1st Wed., 5:30 pm, San Francisco. Call: (415)979-8450. [Exp. #99.]

The Association For Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #100.]

Association Of Database Developers (ADD). Meetings: 2nd Thurs., 7:00 pm, The Gatehouse, Fort Mason Center, San Francisco. Organization for professional xBASE language systems developers. Membership $50/yr or $5/meeting. Call: JoAnn, (415)863-6706. [Exp. #101.]

The Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thurs., 6:30 pm, Amdahl Corp., Sunnyvale. Call: Doug Jones, (408)737-5999. [Exp. #101.]

Computer Professionals For Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, Rm. 608-7. Call: Judy Stern, (510)643-7499. [Exp. #101.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #98.]

IEEE Computer Society, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)905-4400. [Exp. #99.]

Independent Computer Consultants Association, Northern California Chapter. Meetings are open to all. Only national trade assoc. comprising non-aligned working computer professional with in-the-trenches experience. Call: ICCA, (415)441-2948. [Exp. #102.]

International Computer Professional Association. An association for software professionals who want to work abroad. Call: Tony Rodriguez, (415)252-7467. [Exp. #98.]

International Network Of Women In Technology. Dedicated to significantly increasing the leadership of Women in Technology in industry and government. Call: Dr. Carolyn Turybfill, (415)336-1007. Email: Carolyn Turybfill@Eng.Sun.COM. [Exp. #100.]

Networkers' Toastmasters. Meetings: Every Tues., noon–1:00 pm, 2560 N. First St., San Jose. Call: Mona Kellem, (408)534-1255. [Exp. #98.]

North Bay Systems Professionals. Meetings: 3rd Wed., 7:00 pm, Holiday Inn, Terra Linda, 1010 Northgate Dr., San Rafael. NBSP provides a forum and network for system professionals. Call: Harry Chapman, (415)291-0174. [Exp. #101.]

Robotics Society Of America. Meetings: 2nd Mon., 8:00 pm, Exploratorium Library, San Francisco. Call: Brad Smallridge, (415)550-0588. [Exp. #101.]

SBEA (South Bay Entrepreneurs Association). Meetings: Twice weekly. Financial success and personal growth through teamwork. Call: (408)727-5950. BBS: (408)267-8325. [Exp. #99.]

Society For Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:00 pm, Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Call: Rich Julius, (415)837-0397. [Exp #102.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #103.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #102.]

United Sysops Association. Meetings: 2nd Wed., 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Organization of bulletin board sysops and users. Call: Bill Strouse, (408)739-9081. [Exp. #101.]

Women's Computer Society. Meetings: Last Tues. Call: Tanya Halepota, (415)949-3936. [Exp. #98.]

USER GROUPS

ACCOUNTING SOFTWARE

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wednesdays. Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #98.]

AMIGA

3rd Dimension—Imagine/Lightwave User Group. Meetings: 1st & 3rd Mon., Computer Showcase, 2739 Geary Blvd., SF. Call: Ollie, (415)863-8792. [Exp. #102.]

AAA—Amiga Addicts Anonymous. Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (510)935-0829. [Exp. #100.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #102.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #100.]

Amiga Nation. Meetings: 1st Tues., 7:30 pm, 324 Springs St., Suisun. Call: (707)421-2283. [Exp. #98.]

Amiga User Group—Germany. German Amiga user group is seeking contacts in the US. Contact: Nils Wietelmann, Unter den Heestern 28, W-2839 Kirchdorf, Germany. [Exp. #102.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary, SF. Call: (415)584-8406. [Exp. #103.]

FAUG—First Amiga User Group. Meetings: 1st Tues., 7:00 pm, HT Electronics, 275 N. Matilda Ave., Sunnyvale. Call: Mike Fisher, (415)855-9426, BBS (415)595-2479. [Exp. #100.]

TOGA—The Other Group Of Amigoids. Meetings: 4th Sat., 12:30 pm, Milpitas Library, 40 N. Milpitas Blvd. Call: Lawrence Brown, (408)984-6036. [Exp. #100.]

APL

APL Bay Area User Group. Meetings: 2nd Mon., 7:00 pm. Call: Tibor Horvath, (415)283-5611. [Exp. #100.]

APPLE

Tri-Valley Apple II User Group. Meetings: 1st Wed., 7:00 pm, Glendale Federal Bank, 3101 Crow Canyon Place, San Ramon. Come and learn more about your computer. Support II+, IIc, IIe, IIgs. Call: (510)828-0959. [Exp. #99.]

AT&T

AT&T Computer User Group, North Bay. Meetings: 1st Wed., informal discussion at 6:00 pm, program begins at 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. MS-DOS and UNIX. Call: Jim Lansing, (415)885-6631 or Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #99.]

AT&T Computer User Group, South Bay. Meetings: 2nd Wed., informal discussion at 6:00 pm, program begins at 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. MS-DOS and UNIX Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #99.]

AT&T UNIX Computer User Group, South Bay. Meetings: 4th Wed., new user education at 6:30 pm, program begins at 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #99.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. San Francisco. Call: (415)469-7924. [Exp. #102.]

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Aud., 2nd fl., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #101.]

Santa Clara Atari User Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computers Showroom, 1278 Alma Court, San Jose, near First and Alma. Call: Ron Reade, President, (408)225-7162. BBS: (408)848-6032, 300/1200/2400. [Exp. #99.]

CAD/CAM

SF Bay Area AutoCAD/DCA Software User Group. Meetings: 3rd Wed., 6:30 pm. All CAD users welcome. Call: Michael Foley, (510)734-0707. [Exp. #103.]

COMMODORE

64/More CUG, Cupertino Chapter. Meetings: 3rd Sun., 6:00 pm. Cupertino Library. Call: (408)262-9334. [Exp. #100.]

64/More CUG, North Valley Chapter. Meetings: 2nd Sat., 10:00 am. Milpitas Library. Call: (408)262-9334. [Exp. #100.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #102.]

CAVE—Commodore Amiga Video Enthusiasts. Meetings: Every other Sat., 8:00 pm, 304 Springs St., Old Suisun. Call: Ron, (707)421-2283. [Exp. #98.]

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)793-2514. [Exp. #101.]

CP/M

San Francisco Computer Society. Meetings: 7:00 pm, Laguna Honda School, 1350 7th Ave., San Francisco. Call: Ralph Gallegher, (415)929-0252. [Exp. #101.]

dBASE

ADD dBASE Software SIG. Meetings: 3rd Tues, 7:30 pm, Fort Mason Center, San Francisco. Led by Miriam Liskin. Call: JoAnn, (415)863-6706. [Exp. #101.]

ADD Fox Software SIG. Meetings: 1st Thurs., 7:00 pm, Fort Mason Center, San Francisco. Call: JoAnn, (415)863-6706. [Exp. #101.]

East Bay Database User Group. Meetings: 3rd Sun., 1:30 pm, 2415 Grant St., Berkeley. Call: David Chilcott, (510)653-1303. [Exp. #98.]

DESKTOP PUBLISHING

Bay Area Desktop Publishing User Group. Meetings 1st Wed., 7:00 pm, Nisha Software, 2493 Telegraph Ave., Berkeley. Topics include editing and publishing as a career. Call: (510)848-8200. [Exp. #103.]

San Mateo County Ventura Publisher User Group. Meetings: 3rd Mon., 6:45 pm, San Mateo ROP, 1800 Rollins Rd., Rm. 14, Burlingame. Call: Elinor Cruze, (415)366-5317. [Exp. #99.]

FREEDOM, PRIVACY, AND TECHNOLOGY

BMUG SIG On Freedom, Privacy, And Technology. Meetings: Last Sun., 2:00 pm, BMUG office, 2055 Center St., Berkeley. Call: Judi Clark, (510)549-2684. [Exp. #100.]

IBM AND COMPATIBLES

Alameda Computer User Group. Meetings: 2nd Wed., 7:30 pm, Social Hall, Temple Israel, Island Dr. and Mecartney Rd. Providing an informal forum for both Macintosh and PC users to explore questions about hardware and software. Call: Dan Meyers, (510)521-3323. [Exp. #99.]

Berkeley PC User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle Systems, 2618 Telegraph Ave., Berkeley. Presentations followed by discussion, PD library, newsletter, Geo Ensemble SIG. Call: Mel Mann, (510)526-4033. [Exp. #101.]

Delta PC Users Group. Meetings: 3rd Sat., 10:00 am. Call: (510)427-2255, ext. 744. [Exp. #101.]

DVPC—Diablo Valley User Group. Meetings: 1st Thurs., 7:30 pm, Corondolet High School, corner of Treat Blvd. and Winton Ave., Concord. SIGs include WordPerfect, Windows, Paradox, Beginner's, Visual Basic, and a new education/entertainment group. Call: (510)943-1637. [Exp. #100.]

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, Apostleship of the Sea, 600 Terminal St., Oakland. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #101.]

EPIC—EastBay PC IBM Computer Club. Meetings: 2nd Tues., 7:00 pm, Milpitas Library, 40 N. Milipitas Blvd. Beginners welcome. [Exp. #100.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon. 7:30 pm, San Rafael Community Center. Free intro to computers class at 6:00 pm. Call: (415)927-2909. [Exp. #102.]

IBM Technical SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Mike Schmit, (408)244-6826. [Exp. #98.]

Micromate-CP/M-DOS User Group. Meetings: 1st Thurs., 7:30 pm, Chabot Observatory, 4917 Mountain Blvd., Oakland. Call: Ed Miller, (510)376-1611. [Exp. #99.]

NBUG—North Bay User Group. Meetings: 2nd Thurs., 7:30 pm, 330 Rogers St., Vallejo. All computer users welcome. Call: (707)644-9327. BBS: (707)643-NBUG. [Exp. #100.]

PC BasicS: Silicon Valley Computer Society SIG. Meetings: 3rd Mon., 7:30 pm, 847 W. Maude Ave., Sunnyvale. Talks presented by Rich Wingerter of Zip Consulting & Design. Call: (415)326-2435. [Exp. #98.]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M li-

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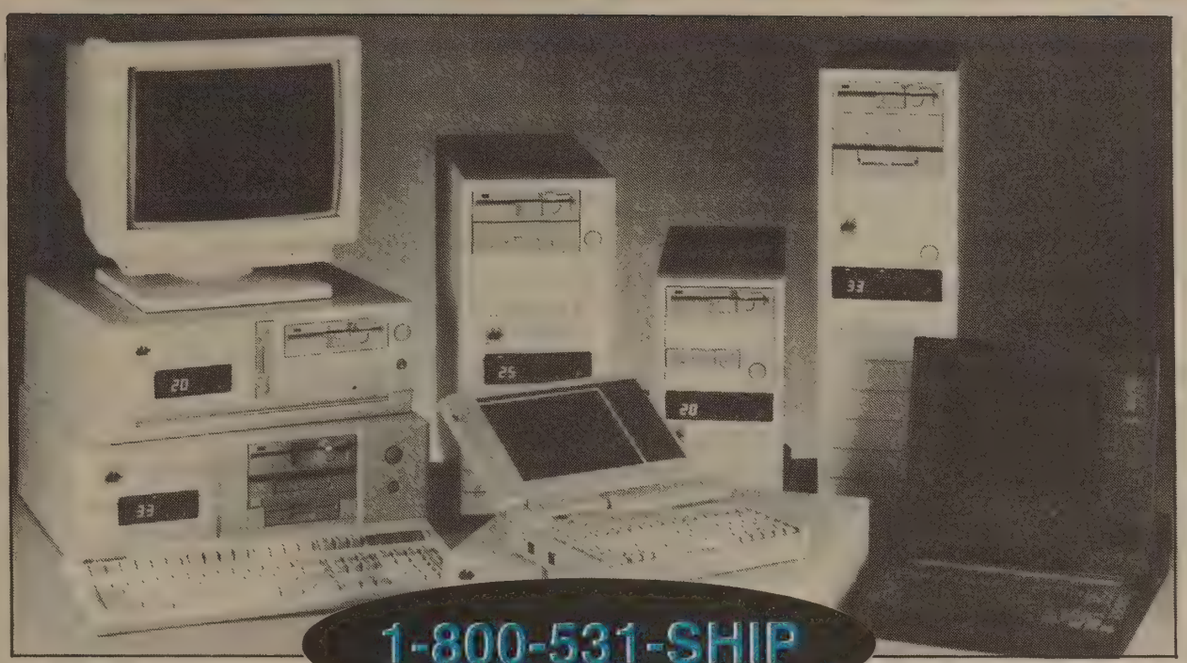

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braries. Call: Larry Welling, (415)593-9981. BBS (415)571-9259. [Exp. #99.]

San Francisco Business Computers. Meetings: 4th Thurs., 5:30 pm. For those who use computers in business. Visitors $5. Call: (415)788-5338. [Exp. #100.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm, Conference Center, Bldg. A, Fort Mason. Call: (415)929-1993. [Exp. #101.]

South Bay WordPerfect User Group. Meetings: Monthly, dates vary. Saratoga Community Library. Free. Call: Martin Van Derpool, (408)238-8434. [Exp. #98.]

Stanford/Palo Alto PC User Group. Meetings: Last Wed., Turing Aud., Stanford. DOS/Windows. Call: (415)329-8252. [Exp. #103.]

KNOWLEDGEMAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (510)947-4878. [Exp. #101.]

LAPTOPS

HPX HP Laptops & Handhelds. Meetings: 2nd Sat., 10:30 am, Sunnyvale. Call: Michael Felsenstein, (415)564-8279. [Exp. #100.]

MACINTOSH

A32 Macintosh User Group. Meetings: 2nd Sat., 10:00 am, GTE Cafeteria, 100 Ferguson Dr., Mountain View. Call: (408)263-0398 days. [Exp. #103.]

BMUG—Berkeley Macintosh User Group. Meetings: Every Thurs., 6:00 pm, Physical Sciences Lecture Hall, UC Berkeley Campus. Call: (510)549-BMUG. [Exp. #101.]

BMUG West. Meetings: Last Mon., 6:30 pm, San Francisco Exploratorium. Call: (510)549-BMUG. [Exp. #101.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 6:45 pm, location varies. A forum for multilingual computing. Call: Roger Sherman, (415)859-5146. [Exp. #101.]

Let's Go Macintosh Computer Society. Meetings: 3rd Thurs., 7:00 pm, Skyline Jr. College, Media Center, Rm. 2105, San Bruno. See and try interesting new products, meet other Mac users, hear guest speakers. Call: Fidel Cajulao, (415)221-2995, or Nolan Apostle, (510)947-2523. [Exp. #103.]

Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Cafeteria, City Center 4, De Anza and Rodrigues, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)356-9901. [Exp. #98.]

Macs Of Marin. Meetings: 2nd Thurs., 7:00 pm, Redwood High School, Larkspur. Marin County Mac User Group for all levels of expertise, beginners welcome, SIGs. [Exp. #102.]

SMUG (Stanford-Palo Alto Macintosh User Group). Meetings: 1st Mon., 7:00 pm, Syntex Conference Center, 3401 Hillview Ave., Palo Alto. Call: (415)328-4933. [Exp. #99.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #100.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #100.]

MULTIMEDIA

BMUG Multimedia SIG. Meetings: 2nd Mon., 6:00 pm, Call: (510)549-BMUG. [Exp. #100.]

International Interactive Communications Society—IICS. Meetings: 2nd Wed., 7:30 pm, Call: IICS Hotline, (415)328-7318. [Exp. #99.]

Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Palo Alto, Rm. H-1. SIG of Software Entrepreneurs' Forum. Call: Patrick Milligan, (408)257-1547. [Exp. #99.]

Multimedia User Group. Meetings: 1st Wed., 7:00 pm, 600 Townsend St., 1st Fl., San Francisco. A forum to learn about the multimedia industry, get your questions answered, and meet with fellow professionals. Sponsored in part by Proxima and Mitsubishi. [Exp. #102.]

MUSIC

MuSIG. Meetings: 1st Sun., 2:00 pm. Various locations. Based in Palo Alto. A network of people helping each other learn about computers and music: MIDI, hardware, software, performance, and programming. Call: (415)858-1493. AppleLink: UG0390. [Exp. #99.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)747-4356. [Exp. #100.]

NEURAL NETWORKS

Neural Networks SIG. SIG for Neural Networks and its applications. Call: Kumar, (408)946-5835. [Exp. #98.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. Call: (415)327-BANG. Email: info@BANG.org. [Exp. #102.]

Berkeley NeXT Users Group. Meetings: 2nd Tues., 7:00 pm, 2055 Center St., Berkeley. Call: Bernt Wahl, (510)644-0139. [Exp. #98.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)739-9081. BBS: (408)739-8753. [Exp. #99.]

OMNIS 7

GUIdata Bay Area Omnis 7 User Group. Meetings: 1st Mon. Newsletter, forum for all users. Call: Peter Bennett, (510)935-5203. [Exp. #101.]

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm. For anyone interested in OS/2. Presentations, product demos, questions and answers. Call: (415)755-3124. [Exp. #103.]

PEN COMPUTING

Pen Systems SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Addresses all issues of interest for developers of pen computing software. Call: Bill McApline, (415)348-2257 or SEF at (415)854-7219. [Exp. #99.]

PROJECT MANAGEMENT

Microsoft Project User Group. Meetings: 3rd Mon., 6:30 pm, TEK/LINK Corp., 2901 Tasman Dr., Suite 207, Santa Clara. Project management solutions with Microsoft Project software—both PC and Mac. Call: Henry Viveiros, (408)293-5201. [Exp. #101.]

Q&A

East Bay Q&A User Group. Meetings: 4th Tues., 7:00 pm, San Leandro. Developing and expanding the many uses of Q&A database/word processor program by Symantec. Call: (510)475-8062. [Exp. #102.]

West Bay Q&A User Group. Meetings: 2nd Tues., 7:00 pm, Redwood City. Developing and expanding the many uses of Q&A database/word processor program by Symantec. Call: Philip Edwards, (510)475-8062. [Exp. #102.]

R:BASE

Peninsula R:Base User Group. Call: Don Whitecar, (415)592-5033. [Exp. #99.]

SQL

SQL_Forum/Bay Area SQL Database Server User Group. Meetings: Once a month in downtown SF. Oracle, SQL Server, SQLBase, and more. Call: Robert Gentry, DBBS, Inc. (415)583-3000. [Exp. #99.]

TELECOMMUNICATIONS

BMUG Telecom SIG. Meetings: Last Wed., 8:00 pm. How to use your modem, terminal programs, and the BMUG BBS. Call: (510)549-BMUG. [Exp. #101.]

SDL Interest Group. Meetings: 1st Thurs., 5:00 pm, Anonymin, 50 University Ave., Los Gatos. To discuss and exchange ideas on SDL, the CCITT z.100 standard for telecommunications description and design. Call: Malou Zanni, (408)399-5030. [Exp. #103.]

TEXAS INSTRUMENTS

Santa Clara Valley TIPC Group. Meetings: 4th Thurs., 7:00 pm, Magnolia Inn, 176 S. Bernardo, Sunnyvale. Newsletter, library. Call: Thor, (415)386-5237. [Exp. #102.]

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #100.]

THEOS

Theos User Group. Call: (510)785-7355. [Exp. #100.]

UNIX/XENIX

N. Cal UNIX Users. UNIX user group now forming: AT&T UNIX, Coherent, SCO UNIX/XENIX, and LINUX. Write: Just Computers, PO Box 355, Cotati, CA 94931. [Exp. #99.]

UNIX SIG. Meetings: 2nd Tues., DEC, 800 W. El Camino Real, Mountain View. Sponsored by Software Entrepreneurs' Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #98.]

VIDEO TOASTER

Video Toaster User Group. Meetings: Last Thurs., 7:00 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, plus info/tips on new System 2.0. $4 for non-members. Call: Andrew Timmins, (408)244-9692. [Exp. #101.]

WINDOWS

WinSIG. Meetings: 3rd Thurs., 7:00 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. Windows SIG of the Software Entrepreneurs' Forum. Call: Fran Finnegan, (415)929-7386, or Barbara Cass, (415)854-7219. [Exp. #103.]

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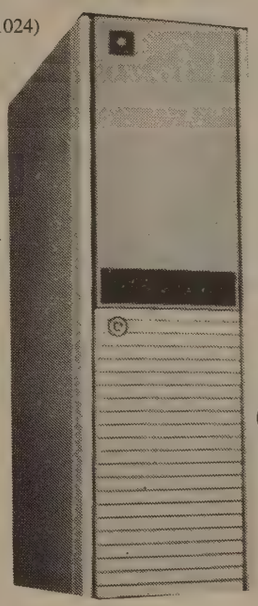

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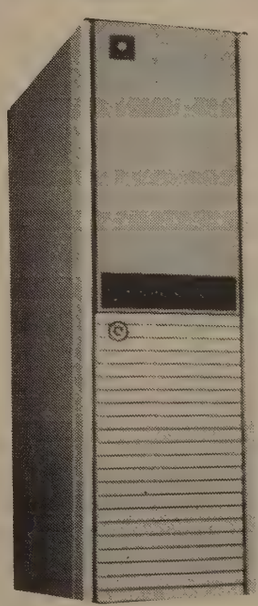

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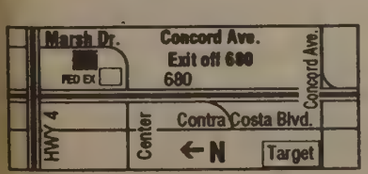

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ity. As for the TrueType fonts, they're not only far cheaper than their bitmapped and PostScript equivalents, but they're so much *smaller* that the saved disk space counts as part of the Windows payback. As soon as I had TrueType I was able to delete over 10 meg of PCL fonts, recovering over half the room I needed for my whole Windows installation.

Between the newfound stability of Windows itself, and the breathtaking maturity of this generation of Windows apps—like WinWord 2.0, Excel 4.0, and the newest Corel Draw—I have to call Spisak's "serious drawbacks" negligible in light of available power and flexibility.

Kip Crosby
El Cerrito

BAH! HUMBUG!

Considering all the bitching about Windows 3.0, 3.1, and OS/2, I will gladly stay with DR DOS 5.0 or 6.0, or any DOS, and be happier, have less crashes, less problems, and be out fewer dollars.

Also, I bet we will have more DOS applications and will be using more DOS applications in the year 2000 than any other operating system.

Ray Stahl
San Francisco

AMIGA SUPERAPPS

How ironic that Matthew Leeds' "Farewell to the Amiga" should appear in the same issue as Birrell Walsh's article on building "Super Applications" [Issue #96N]. I would have said farewell to the Amiga years ago if it had not been for its unique capability of supporting super applications.

In the MS-DOS world one has to work against a single-tasking operating system and applications that think they own the whole machine. The Amiga operating system is multitasking, and applications are designed to cohabit with other applications. Instead of instructing an application to endlessly loop until it is needed, Amiga applications "go to sleep" until the operating system detects activity for them. Thus the application in a "super application" that needs CPU or other system resources gets it, and the others stay out of the way. Additionally, the Amiga implementation of the Rexx language provides a programming language that doubles as a super scripting language common to most Amiga applications.

One of my Amiga super applications updates over two hundred 630X15 cell spreadsheets in less than one hour. Another opens a 630X15 cell spreadsheet, creates five graphs in separate windows, and rearranges the windows in twenty-five seconds.

Unfortunately, the designers of other operating systems have not made super application building a priority. This is probably because the demand is not present. Not only does it take a certain amount of imagination, but also some programming ability to tie different applications together to create added value. Super application building is likely to remain a specialty, at least for the foreseeable future.

Jack Fox
Oakley

AMIGA VISION

It appears to me that you are dropping your column re the Amiga, and in so doing, some of your responsibility as California's Computer Magazine.

I am a member of the Los Angeles Amiga Users Group. There are many Amiga owners and users out here, and we are into all the various aspects the Amiga manages to provide that are not so easily provided on either the PC or the Mac—cost as well as applications.

Maybe the number of Amiga owners/users does not compare against the number of PC and Mac owners/users, but I think John Walker from Autodesk [Issue #95N,S] had it right when he said, "But that took a lot of imagination. You had to be plugged in to what had been done on the high end, to see the potential, and you had to believe in something that I think for a lot of people is very difficult to believe in." The point being that although it's not the most popular of platforms, the Amiga is out there on the future lines of where home computers can go.

Three-D graphics and modeling are already very common among Amiga owners, as well as animation, digitizing from video cameras and cassettes, video editing, and digital music creation; and it is a very simple thing for an Amiga user to put these creations onto video cassettes as a composite whole presentation with a high degree of professional quality. All this without the cost it would take to do the same thing on other platforms.

I realize that the market is not that big comparatively, but it has to be put there. It has to be written about, it has to be pushed, you've got to show people what is there and what can be done. There will come a point when the realization occurs, and at that point it will blossom and get very big. Probably to the point of permeating our whole lives.

I would think that your integrity would place you at the front of this line, not dropping it because it's not the popular thing to do. Because it will catch on, and then watch out. The Amiga is a creative engine and there are a lot of people out there with a creative and aesthetic urge.

Maybe Commodore is not the best parent for this child, but sometimes outsiders can do more for the proper nurturing of a child than any parent. Your help on this line could make the difference. It all depends on how you approach it.

It will happen. Are you going to be there?

Mike Rubio
Los Angeles

Well...

As we've said several times now, we're committed to continued support of the Amiga community, and are working on ways to provide ongoing support for this platform.

Rich Grace's article in this issue is one example of the kind of information we hope to provide. Watch for further developments.

—eds.

BIG MAC, LITTLE MAC

I came late to the Little Mac/Big Mac Book title controversy, discovering it only through Lloyd Short's letter [Issue #96N].

Let me see if I've got this straight. Que published a book titled *The Big Mac Book.* Then Peachtree published a book on a similar subject called *The Little Mac Book.* Peachtree did not position its book, a tutorial, against Que's book, a reference, by using the second most obvious name for a general Mac book, and at the same time give a nod to Que's Big Mac book. No, they stole the title right out of Lloyd Short's head!

No wonder he stole the title back by publishing a second *Little Mac Book!*

Sorry Lloyd, your justifications are ridiculous. Your titling scheme was a burn job. You ought to be ashamed.

Brad Asmus
MCI Mail

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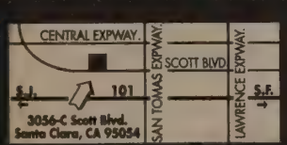

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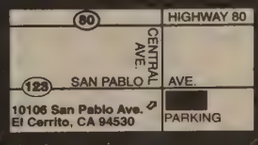

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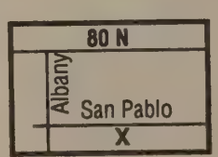

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continued from page 50

"because it would have been too expensive to put in the 30,000 feet of lines we needed. Laser technology is limited in distance to about 2000 feet and is also very expensive. Instead, we are using microwave links to monitor and view the Titan firings up on the ridge near Boron, CA. We have towers with dishes at the 100-foot level. We're also installing links between our supercomputer and our test facilities, and also to Kirtland AF Base, Albuquerque, NM. So far, they're all working real well."

As good as microwave network links have shown themselves to be, a significant improvement soon to be available will be self-diagnostics all the way to the radios using SNMP (Simple Network Management Protocol). This will make it possible to identify the source of an outage without going up on the roof, without even traveling to the customer's site. Until then, it will continue to take a measure of expertise on the part of the vendor to isolate connectivity problems that could be in the bridge, the network, or the microwave equipment.

Microwave Bypass is also working on making a microwave radio link that matches FDDI (fiber optic) standards. This has never been done before, and if accomplished will make microwave links transparent to an even wider range of network configurations. ■

MICROWAVES OF THE FUTURE

One of the exciting prospects for the future of microwave networking is something called teleradiology. In essence, this technology allows doctors at one facility to view the computerized images obtained at a distant facility. Since imaging equipment costs millions of dollars and requires highly trained technicians to operate, it's prohibitive to have a full imaging installation in every community. Teleradiology typically requires a full bandwidth ethernet link across town or from one town to another. Microwave is a practical technology for this type of communications that allows many facilities to share the cost of the medical imaging equipment, and thus makes it practical for more patients who may benefit.

In Los Angeles, medical centers at UCLA, Cedars Sinai, and the Veterans Administration are already planning to install the requisite microwave links for a complete teleradiology system.

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1N5243 Zener Diode 13V 500mW	1369	.14	.11	.09	.07
1K 10 Watt Resistor	7874	.25	.20	.18	.15
75 Ohm 5 Watt Resistor	5344	.25	.20	.18	.15
1K DIP Resistor, 16 pin 15 element	1459	.50	.40	.30	.25
100K SIP Resistor, 8 pin 7 element	4594	.19	.17	.15	.11
5 pin DIN Socket, Cable Mount	11640	1.25	1.00	.75	.50
AC Line Cord, 16/3 SJT 6' Grey	11969	2.25	1.50	.95	.75
AC Line Filter, 6 Amp w/ IEC Recept.	7715	4.50	3.00	2.00	1.25
Battery Holder for 4 AA's, wire leads	12706	.79	.70	.50	.40
DIP Relay, 3.8-10VDC, 12 mA cont.	11970	2.49	2.00	1.50	1.00

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FM-10 FM STEREO TRANSMITTER That's right, we said STEREO! Just connect a cassette deck, CD Player or mixing panel to the FM-10's line-level inputs, find a clear frequency, and you are ON THE AIR with a school, home, camp or neighborhood FM station, operating per revised FCC Part 15 Rules! Use the built-in whip or your own antenna. Easy step-by-step assembly and operating instructions, plus helpful FCC rules information. Tunes 88-108 MHz, very stable RF output, internal 9V Battery, RCA left and right inputs, adjustable stereo balance, great stereo separation, adjustable subcarrier, PC-Board power switch. $29.95 Case & Knob Kit $12.95

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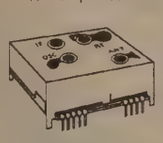
HSC# HCFIDOE **$19.95**

Teeny Tiny Tuner Modules

The unusual item at left is a MITSUMI CRTV9-AC55F 83 Channel Reverse Converter -- the opposite of a tuner - input IF signal (45.75 MHz) converted to one of 83 CATV signal frequencies (55.25MHz to 547.25MHz) selected by voltage input to varactor diode (3-24VDC). Requires +12,+5VDC-- Pinout, Spec. Sheet & Block Diagram included. Body Measures 3.75"x2"x.75". Useful for Amateur TV? Hams?

HSC #13120 **$14.95**

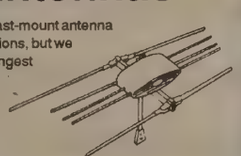


Here is a little module that you won't find anywhere else! This tiny (only 1" x 1.75" x .5") PC mount package is a varactor tuned FM tuner! Made by Toko (Model #TMC103A) for use on an IBM PC FM Subcarrier adaptor board. Uses 8 - 12VDC, tunes from 88.3 to 108.1 MHz from 75 ohm antenna input, has 10.7 MHz IF output with VCO output for control feedback to tuning circuitry. We provide a schematic of a suggested application showing pinout of this module with related tuning circuit.

HSC #13101 **$4.95 ea. or 10/$39.95**

Broadcast FM Antennas

A. Winegard SR-8108 Yagi-type FM/VHF Antenna. Small mast-mount antenna appears to have been designed for attic or drop-ceiling applications, but we can't see any reason not to use it outdoors. 22.5" boom, longest element is 67". It was intended for the data receivers we featured in previous ads, but will of course work fine for FM Broadcast reception with your stereo, as well as VHF/TV reception! New with assembly and mounting instructions.



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B. Dipole antenna (not shown). Typical 300-ohm stereo FM-type dipole antenna with built-in balun for 75-ohm coax, plus a six-foot coax cable with F-connectors. Works great with FM stereos, VHF TV's, or the units at right!

HSC #13087 **$1.95ea. or 10/$15.00**

C. FM "Rubber Ducky" Antenna ...18" long with pivot joint on mounting box, 75-ohm coax cable (6 foot) with "F" connector. Could be used in place of "D" above.

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Sept. 12	**Foothill College Electronics Flea Market** - Last one of '92!
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dustries, as well as government agencies, are noting productivity gains of 20% or better resulting directly from the institution of telecommuting. Organizations that try it are generally happy with some of its other benefits, too: reduced turnover of highly trained employees, greater job satisfaction, lower overhead costs, access to a larger pool of employees, and—of course—a small but significant contribution to reducing rush-hour traffic and lowering auto emissions.

One of the most common reasons a company begins to consider telecommuting is the need to expand or to move the central office. Since expanding the total amount of office space can cost a great deal to begin with, and also adds considerably to the monthly overhead, many organizations look favorably on any alternative which can help them get more work done in their present facility. Telecommuting effectively reduces a company's total space requirement by "time sharing" some of the desks, parking, telephones, meeting rooms, and other fixed resources. At AT&T, for example, the "virtual office" program has reduced Bill Clay's floor space requirements from about 230 square feet per employee to about 85 square feet.

Additionally, relocating any distance—even a few miles—creates staff problems, particularly when a large number of proven, trained employees balk at commuting to the new location. Telecommuting takes some of the pressure off by reducing the need to drive or take the train every day, thus making it easier for key employees to stay with the firm after the relocation. A telecommuting program also gives a firm the opportunity to hire more qualified people who may live a relatively long distance from the central office.

For all the glitz and technology, however, telecommuting doesn't seem likely to eliminate all office hours any time soon. At present, the most successful programs are those used to reduce the total time an employee spends in the central office to a level where each hour becomes more important, but costs the company less. People then use their hours or days in the office to conduct group meetings and other important face-to-face contacts and exchanges of information that bind a group of strangers into an effective, productive team. Routine correspondence and staff memos tend to be handled more efficiently over the phone, the fax, or the modem.

One pattern that has emerged in successful telecommuting programs is to have employees spend at least one or two days in a centralized office. This gives everyone the chance to remain part of the office team, to reconnect with colleagues and project timetables, to attend important meetings, and to demonstrate to supervisors that they are keeping up with their responsibilities. AT&T, for example, considers its "core offices" to be something like "drop-in centers," where shared work spaces are provided. Each work space contains a desk, a phone, and a jack connecting the portable computer to the data network.

In addition to AT&T, employers in pharmaceuticals, computer hardware and software, manufacturing, utilities, and other industries, as well as government agencies, are noting productivity gains of 20% or better resulting directly from the institution of telecommuting.

There's also secretarial support, meeting rooms, and office equipment. Unlike traditional office space, however, telecommuting means you need only one such work space for every ten sales people.

Telecommuting also seems to work best when the employees selected for this mode of work are carefully screened, evaluated, and trained. Certain jobs—such as telemarketing, computer programming, writing and editing, administration, and executive decision-making—convert to telecommuting more easily than others. The most effective telecommuting efforts are those that help employees develop specific goals to achieve, and that measure their success by results rather than by hours clocked or meetings attended.

Success at telecommuting also seems linked to employees who have stronger-than-average motivation and drive to succeed. People must not only master the technology—the computer, the fax, the modem, and the teleconference—they must master themselves. Successful telecommuters tend to be independent enough to keep working without the eyes of the supervisor upon them. The ones who enjoy it are those who are self-sufficient enough to stay productive without the hourly feedback and support of colleagues. It helps when employees are trained in time management and goal-orientation, so they generally deliver their results on time and target for others—who themselves may be telecommuters—to rely on in fulfilling their own responsibilities.

One of the most obvious advantages of telecommuting is that it eliminates a great deal of back-and-forth travel time. The average commute for people based in Los Angeles, for example, is about an hour one way. With telecommuting, a day's round-trip travel is eliminated, giving each employee more time and energy for the thinking, the writing, the telephoning, the planning, and the reporting work which keeps the business organization moving forward.

AT&T has taken advantage of the telecommuting concept to hire sales people who live within the territory they will serve. "Many of my people live and work in remote areas," says Clay, "and with this technology they can operate out of their homes and their cars as easily as they once did out of our regional offices."

Because they need not travel to a central office, telecommuters who live in their territories can remain physically closer to their clients. Although AT&T still has its people spend time in a designated core office, they regularly spend part of each day, or a full day each week, at home catching up on phone calls and paperwork. In less populated areas like Nevada, employees can easily and effectively work directly from their cars, stopping between distant appointments to check in with the office, and to send and receive data to and from customers and others in the organization.

Additional telecommuting time savings come from not having to get dressed to go into the main office every day, and from not having to recover from the exhaustion of commuting. This time can often be translated directly into extra time people spend with their families.

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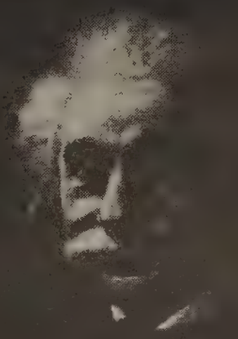

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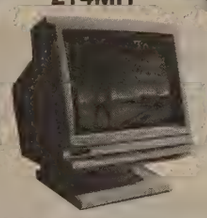

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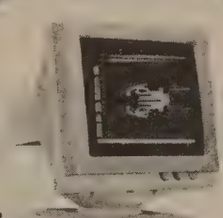

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- HF: 31.5/ 35.2/ 35.5KHz
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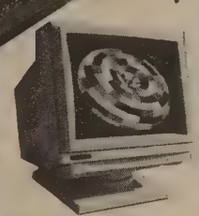

214S28 SVGA Color
- 14" tube, 0.28mm Fine dot pitch
- 1024x768, 800x600 640x480 (Auto-sizing)
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"One employee," says Clay, "was working from the hospital waiting room right up until the minute his baby was born. He wanted to be there, and with our virtual office technology, he was able to be productive while he waited."

The virtual office program began a few years ago for people in remote areas like Nevada. AT&T installed dumb terminals at their homes, with the idea of letting them access online systems or send and receive email without having to drive to the central office. The system proved so effective, and hardware costs came down so far, that the company decided to provide a more complete virtual office environment to whole divisions, beginning with Clay's commercial markets group. The move to laptops started about January 1991, and is now spreading beyond sales people to selected staff positions, too. The company's target is to keep moving forward until 95% of the Commercial Branch organization is operating in the virtual office mode.

By all accounts, the program is a major success. Bill Clay can point to significant savings from the program, such as the several million dollars per year he saves from reducing his floor space requirements by about 63%. These space savings alone easily pay for the division's telecommuting equipment. In addition to closing some of the smaller offices and reducing the size of others, the reliance on telecommuting has cut the need for clerical support. People now type and print a memo on their own, completely bypassing secretaries. The company's email network also eliminates the need for a lot of correspondence to be typed and forwarded by support staff.

Other improvements are harder to quantify. For example, the telecommuting mentality has much improved communications between West Coast and East Coast people, too. Says Clay: "Most of these people wouldn't normally talk to each other if those on the West Coast had to get dressed and drive in to the office in order to be available for a morning conference call with those on the East Coast. But now we talk regularly from wherever we happen to be, from airport terminals, coffee shops, or what have you."

The frequent teleconferences have reduced the need for face-to-face meetings. "We've begun to break the bonds of having to see everyone personally," says Clay. "My managers are learning to manage more effectively via teleconferencing. The telephone eliminates much of the up-front banter. On the phone you tend to get to the point quicker."

"The result is productivity improvement," says Clay. "People are more effective. I have a few who prefer to work late at night, and they appreciate being able to work according to their personal habits. Also, people can react immediately when something comes to mind, rather than make a note and do it tomorrow. This gives us a much smaller backlog, and quicker response to customers. Because we've cut down on travel time to and from the office, people can stay closer to home and still cover wider areas. This lets them get to customers much quicker and more often. Customers can just page them, and with the virtual office equipment we generally call back right away. They also have a closer connection to their customers, not just physically. They're more aware of what's happening in the community around them. Although I don't have the exact figures to cite, sales are much better as a result." ■

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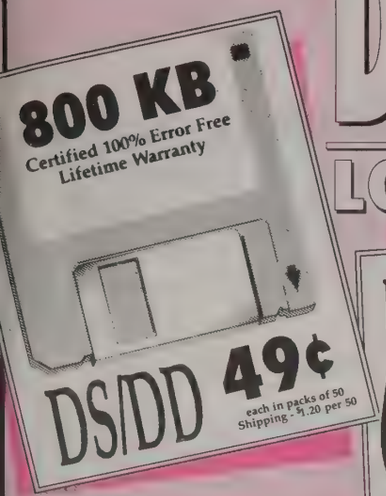

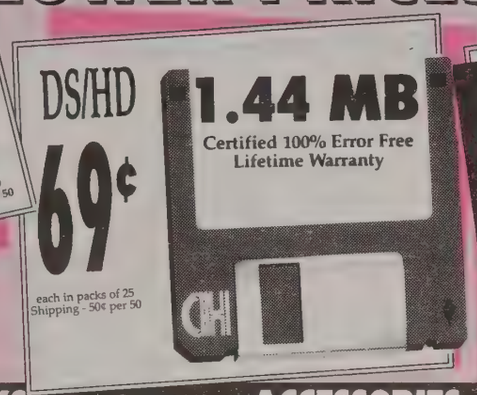

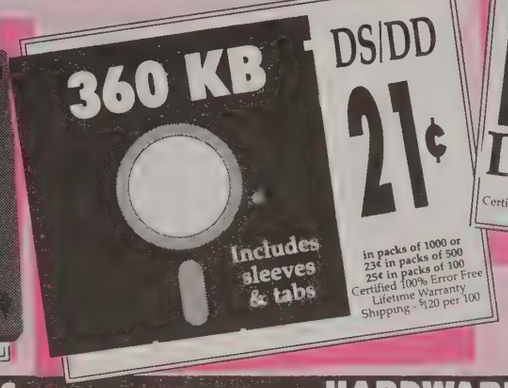
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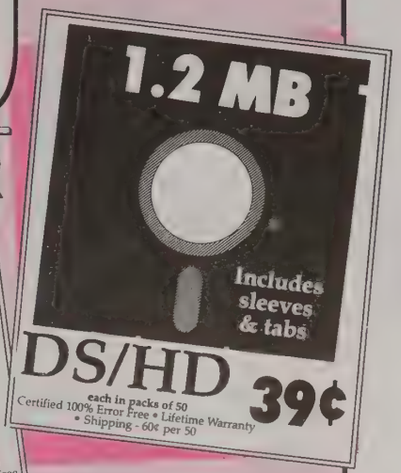

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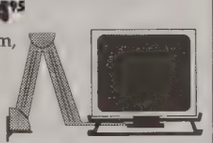

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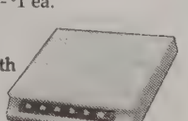

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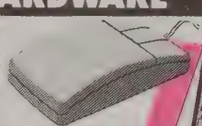

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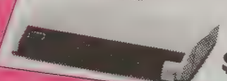

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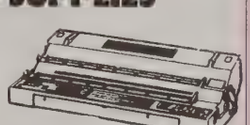

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continued from page 114

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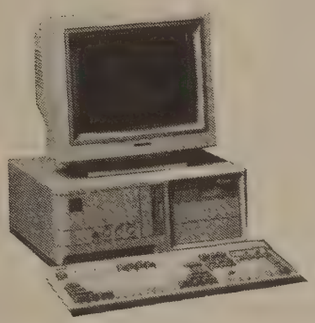

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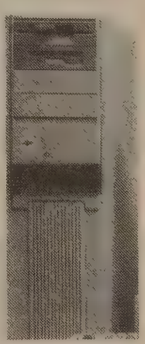

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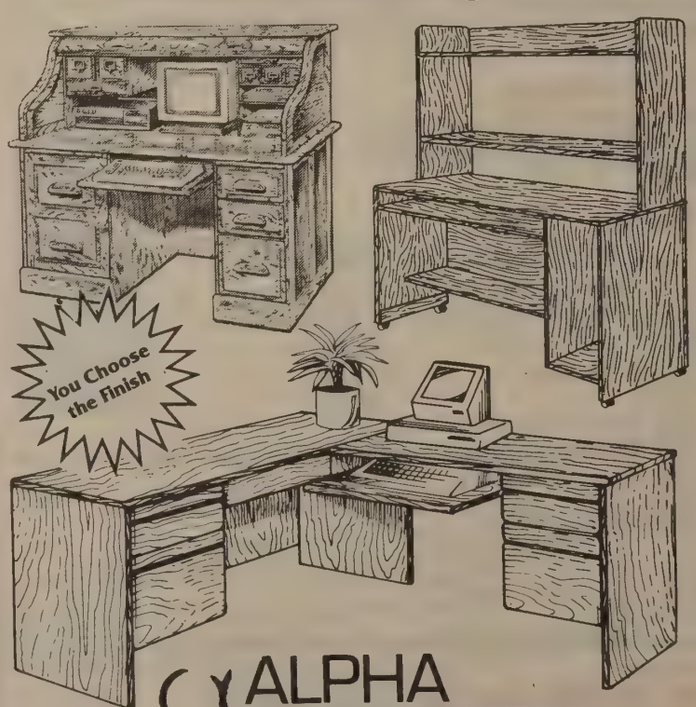

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Actual Desk Similar to Illustration

continued from page 140

card can accommodate an 80287 math coprocessor, which makes the Bridgecard fairly suitable for CAD work. The vast majority of DOS applications, such as Word Perfect, Microsoft Quick Basic, Quick C, and Word, and spreadsheets such as Lotus 1-2-3, do run very acceptably on such a system.

Is the Bridgecard stable? Well, we're running DOS 5.0 plus a wide selection of DOS applications, and have had absolutely no problems.

Don't try running Windows, though. Slow as molasses!

PC/AMIGA EXPANDABILITY

Although Commodore provides a utility with the Bridgecard which allows it to access a DOS partition on an Amiga hard drive, the process is laborious and results in what's probably the slowest PC hard drive you'll ever see!

The obvious solution is to provide a hard disk subsystem on the PC backplane. Unfortunately, with only three slots available after Bridgecard installation, and no drive bays *at all* available in the Amiga 2000 case, we were confronted by the problem of finding a place to mount the physical hard drive.

The solution to this problem, which I can recommend to any Amiga 2000 user, is the Plus Development Hardcard 105. The Hardcard is a hard disk controller with a complete 1"-high hard disk mechanism built onto the card. The drive itself is of excellent quality, manufactured by Quantum. Installed and formatted, the Hardcard works flawlessly in a Bridgecard-based system, and provides over 100 MB of storage. The Plus Hardcard lists for $595 (and sells in the street for perhaps $450), and is the perfect Bridgecard solution. It also comes in a 50MB version for around $300. It is a superb and reliable product.

Most standard VGA cards will work with the Bridgecard, and I recommend their use, because the CGA and monochrome video provided by the Bridgecard on the Amiga monitor is slow and barely functional. Our standard modus operandi is to use a video switcher to change back and forth between the PC video and Amiga video, and to send the video signals to a Multisync VGA monitor. (It must be mentioned that Amiga video must be modified to make use of a multisync, unless you own an Amiga 3000. This requires de-interlacing circuitry, which is readily available for under $300.)

CONCLUSIONS

One thing we discovered—there are areas in which neither Mac nor PC platforms are state-of-the-art. With the PC, it's processor technology, and with the Mac, it's system architecture.

Nonetheless, I consider this system, with three platforms in a single case without significant problems, to be a technical marvel. No other PC or Mac system has ever achieved this. Creating this platform was not a cheap undertaking, and it is certainly not for everyone. The Wright Engineering Amiga 2000 platform also winds up being a very crowded machine!

However, such a system does exhibit remarkable possibilities. It also points out the technical excellence of this machine.■

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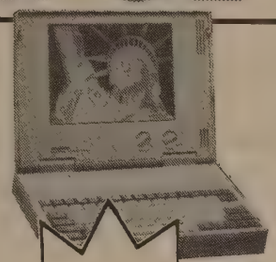

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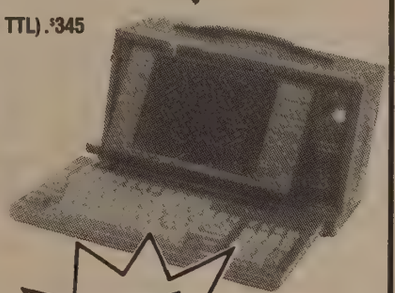

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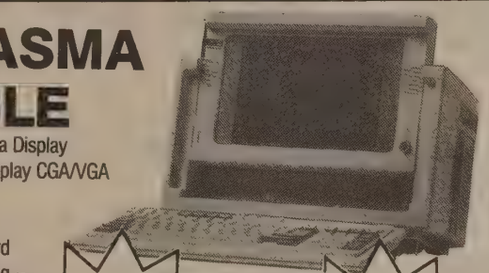

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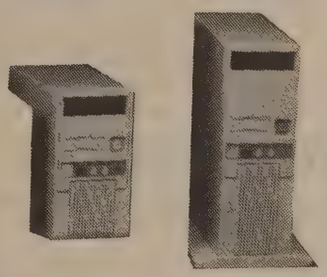

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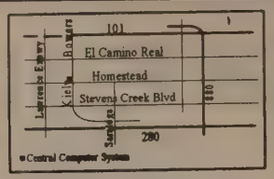

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83S87 - SX20 / SX25	85/95
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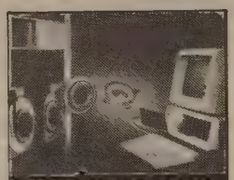

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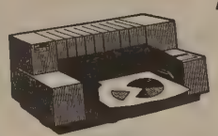

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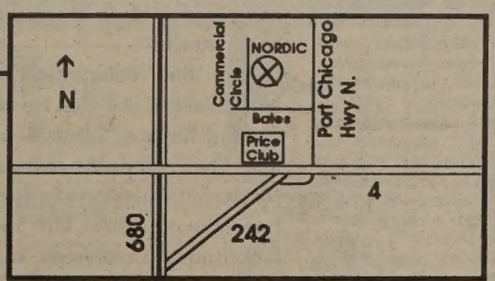

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The Inner Sanctum Of The Microsoft Boardroom

Or When In Doubt, Dream It Out

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DVORAK'S LAST COLUMN

Our story left off in Redmond, where Bill Gates was about to walk in on the office of the Presidents, populated by his new batch of sixteen members.

Gates opened the door. Inside, sixteen men were punching and kicking at each other. Steve Ballmer had Mike Maples by the head, ramming Maples' head into the wall while shouting, "Give up yet??!!"

Maples grabbed hold of Ballmer's trousers and lifted him high, and the two of them crashed to the floor. Gates looked pleased. "Ah, I see my Presidents are competing with each other. That's good."

Just then a small 4-foot gnome of a character ran between Gates legs and screamed at the top of his lungs—"TEN-HUP!! Mr. Gates is here!"—then blew on a police whistle.

The sixteen men snapped to attention and moved around ordering themselves into line with Ballmer at the far left. The little gnome blew the whistle once again, and the entire line of Presidents saluted military style and clicked their heels together simultaneously.

Gates looked left and then looked right. "At ease."

The men each took a seat at the large board room table as Gates, closely followed by the little gnome, walked to the head of the table.

© 1992 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

Gates stood while the others sat. "Gentlemen, we have a problem. Our growth is slowed. OS/2 is actually being used by people. There's a book out about me that I don't like. And Windows is being criticized. In short, our company is under attack."

Mike "Bud" Rabinowitz, president number 10, looked at Gates. He had a sly, cocky smile on his face. "You said you have a problem? That sounds like four problems, boss. Maybe you should have finished that Harvard honors math course, eh?" He laughed and looked around to see stone silence. "Hey, it's a joke."

The other thirteen men dropped their heads. Gates, fuming, pulled a controller from his back pocket and pushed a button. Suddenly the floor opened up under Rabinowitz, and he fell about two stories down into a pit of hungry alligators. Anguished screams could be heard turning to silence as the trap door closed as fast as it opened. Gates looked at Ballmer. "Let's add one of my lookalikes to the presidents' office." Ballmer nodded nervously.

Gates finally sat. "I hope this is a lesson for all of you. Now back to business. We need a strategy to turn around our situation. I want faster growth, no more OS/2, no more books, no more criticism. Suggestions? Round table speed session. Go!"

One by one the presidents threw out ideas. "Lower prices," "Buy IBM," "Shoot the writers," "Buy the computer magazines," "Advertise more," "Give your money away," "Produce better products," "Sabotage OS/2 installations." Round and round they went, maniacally suggesting one thing or another. Faster and faster the suggestions came as Gates watched intently. The pace was frantic, but stopped suddenly as Vern Millerman said, "Get out of the business of *selling* software."

Gates looked at him. "We're a software company. What do you propose?"

Millerman stood. "That we only rent software. At a low price with no charge for updates. Five dollars a month for Microsoft Word. People get a bill for their software use. Instead of paying $300 for a package, they get it free for a few months then a small monthly charge. We make it so the totals including the free upgrades will be far less than the price they'd ever pay for the package plus the upgrades from a software store. In fact it will be dirt cheap. Heck with the $10, make it a dollar a month. For the entire suite of Microsoft applications we can charge $2 per month. With 100 million users that will net $200 million a month or $2.4 billion per year. I mean, who could afford not to buy into this plan?"

Gates nodded and asked, "Where's the growth in this?"

"Market share. We can wipe out the entire industry, then come back and say we were wrong and charge everyone hundreds of dollars for continued use. Unbeknownst to the users the software will expire on a certain date."

Ballmer, seeming a little annoyed by Millerman's idea chimed in. "This is an interesting idea, but I don't see how it will change our image or stop books from coming out."

Gates looked at Ballmer and reached into his pocket for the controller. "I like the idea." Beads of perspiration appeared suddenly on Ballmer's forehead. Gates pushed a button and Millerman fell though a trap door into the pit. Horrible screams were heard. Gates had a look of satisfaction. "In fact, the idea is so good that I'm taking credit for it. Any objections from the board?" The entire group yelled, "NO SIR!"

Gates looked at Ballmer. "Recruit a new president from IBM quitters. Maybe we can learn something from him."

Ballmer made a note, just as a goon squad of black-shirted Microsoft renegades stormed into the room carrying Uzis. The leader spoke first. "Pigs, ptooey! We know what you're up to. We've been monitoring your every move. First you dump Quick BASIC...now this wild scheme! We want Microsoft quality to be returned. *Forever*!" The whole group began a chant "Quality, quality, quality!

Gates broke into tears. "My gosh, you're all right! What a fool I've been. How could this happen? I will never again forsake my duty as a guardian of quality and the American way! God bless you for showing me the light!"

The lights in the room dimmed; a curtain closed across the stage where the boardroom scene took place.

In the audience of the closed auditorium sat the real Bill Gates and Steve Ballmer. Ballmer bounced a bit in his chair. "Well, boss? What do you think? Me and Maples wrote this play. We could do it for COMDEX. What do you think?"

Gates pulled out a Tootsie Roll pop from his pocket, tore off the wrapper and stuck it in Ballmer's mouth.

"It needs a little work, Steve." ■

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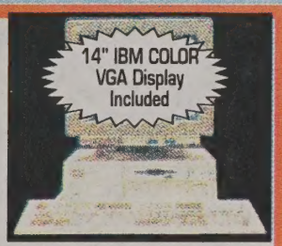

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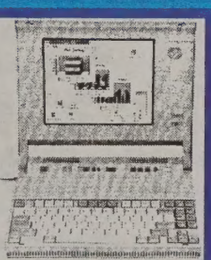

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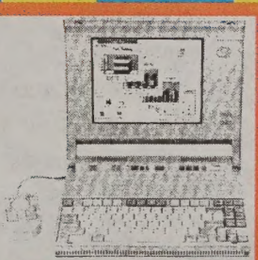

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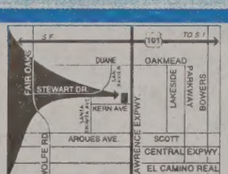

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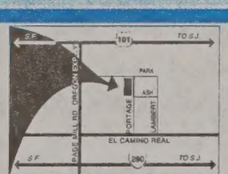

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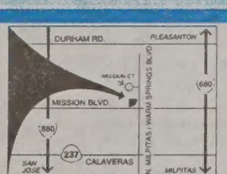

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